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OPPOSED TO A DEFINITE NAVAL PROGRAM.

Secretary of the Navy Moody is understood to be opposed to the laying down of a definite program for the increase of the navy extending over a long term of years, as proposed by the Dayton resolution introduced in the house of representatives some weeks ago. In this respect he differs from the general board composed of some of the ablest officers of the navy. Attention has been called recently by the secretary to the program drafted thirteen years ago. Among other things this provided for the construction of a certain number of rams, for battleships of 9,000 tons and for wooden ships that would not be thought of for the navy of the United States. He fears, in case congress should make a definite program providing for the construction of a certain number of ships of well-defined types, that before the expiration of the period contemplated by the program such great changes would have been made in naval construction that the program could not be adhered to. In anticipation of the passage by the house of the Dayton resolution Secretary Moody recently wrote a letter to Admiral Dewey, the president of the general board, asking the opinion of the board regarding naval increase. In his reply Admiral Dewey said in part:

"The general board is of the opinion that the defense of the coast, insular possessions, commerce and general maritime interests of the United States requires the maintenance of a fleet based upon an efficient strength of forty-eight battleships—the numbers of vessels of the other classes ought to bear a definite proportion to the number of battleships—and the general board is of the opinion further that for every four battleships the fleet should be composed of two armored cruisers, four cruising scouts, four large, seagoing, quick-turning torpedo boat destroyers, together with the necessary auxiliaries, such as colliers, supply ships, repairing ships, etc.

"The general board recommends the adoption of a continuing naval policy to be pursued by congress in making appropriations whereby the strength of the fleet shall be increased regularly at the rate of four battleships, with vessels of other types in the proportions named, until it reaches the limit above stated. The general board understands that the appropriations for this annual increase shall be in addition to those necessary for repairs, to rearm existing ships and to replace vessels lost or struck from the naval list as obsolete or ineffective, and that the necessary additional drydocks and repairing facilities shall be provided as the number of vessels in the fleet increases. The general board further strongly recommends as an essential part of any intelligent continuing naval policy that whenever an appropriation is made for an increase in the material the corresponding indispensable addition to the personnel be authorized."

SHIPPING FEDERATION OF CANADA.

Application is being made to the dominion parliament for an act incorporating as the Shipping Federation of Canada the following interests: James Thom, W. I. Gear, F. A. Ronth, D. W. Campbell, J. G. Brock, C. McLean, and J. Torrance, represent H. & A. Allan; Furness, Wathy & Co. (Ltd.); the Hamburg American Packet Co.; the Robert Reford Co.; F. A. Ronth & Co.; The Elder-Dempster Co.; J. G. Brock & Co.; McLean, Kennedy & Co.; the Dominion Line, and the Leyland Line, at Montreal. The objects of the organization are to amalgamate and federate ship owners, steamship and ship managers and agents, whether individuals or corporations, to consider all questions and matters affecting the interest of the shipping trade of Canada, and to take such steps as may be necessary to promote such trade. In the past those interested in the shipping trade in Montreal and elsewhere in Canada have acted together for mutual protection, and for the discussion of matters relating to pilotage, channel lighting, buoyage, harbor accommodation, and other questions of interest, and the object of the proposed incorporation of the federation is to provide a body through which the trade can act as a unit. There is nothing in the nature of an amalgamation of interests of any of the respective companies proposed, as no attempt will be made to influence rates, etc.

ROACH'S SHIP YARD GETS TWO CONTRACTS.

Roach's ship yard, Chester, Pa., has just been given contracts for two passenger and freight steamers for the Ocean Steamship Co. of Savannah, to be similar in appearance and construction to the City of Memphis of the same line. They will be duplicates and of the following dimensions: Length, 392 ft.; beam, 49 ft.; depth of hold, 27 ft. They will be driven by triple-expansion engines, with cylinders of 28, 46 and 75 in. in diameter and stroke of 48 in. steam will be supplied by four Scotch boilers, 14 ft. 6 in. long by 10 ft. wide, allowed steam pressure of 180 lbs. to the square inch. Accommodations will be provided for eighty first-class passengers. The steamers will have a freight capacity for 4,000 tons. Roach's yard is now building the City of Macon for the Ocean Steamship Co. and a big steamer for the Mallory Line.

THE FIVE NEW BATTLESHIPS.

Congress has satisfied the navy. The unanimity with which every one, from Secretary Moody down, applauded the final decision of congress, which gave five new battleships, was only less striking than the desire manifested by all to hasten the work of building the largest contribution ever made by a single congress in the history of the new navy. The three 16,000-ton ships offer little obstacle to speedy building. They will be constructed almost identically on the plans laid down for the Louisiana and the Connecticut. Two months is the outside limit set for the delays in getting the plans ready and deciding on whatever minor changes are to be made. At the end of this time the bids will be advertised for, and by July 1, when the fiscal year begins, it is expected that all the preliminary steps will have been taken and the money can be expended as soon as it becomes available.

While expedition seems almost certain in the case of the three new 16,000-ton ships, there is less assurance of similar speed on the two 13,000-ton vessels. These ships, if constructed so as to be of the maximum tonnage permitted by the appropriation bill, will be different from all other ships of the navy. The Maine class, including the Maine, Missouri and Ohio, is of 12,500 tons. The Virginia and Rhode Island class are above 14,000 tons. Plans for a new and improved Maine class will be drawn, but the changes involved will require six or eight months to make.

All these battleships will be built by private contract, Admiral Bowles holding that the government has not the proper facilities to build any of them.

The 16,000-ton battleships are to be named Vermont, Minnesota and Kansas and the 13,000-ton battleships, Mississippi and Idaho.

THE ADVERTISING EXPERT.

This is the age of the advertising expert. He begins by insisting that he is an expert and usually adds that he is the only real one in the business. He is blind to the fact that advertising is only applied common sense and that the person most competent to talk about a business is the man who is managing it. He insists that the manager doesn't know anything at all about the business, notwithstanding the fact that he has made a big success in it. He states over and over again that he alone has made a thorough study of the business from its roots up and that he perceives many points which have been overlooked and many avenues in which it may be developed, he adds that he has evolved a plan for the indefinite expansion of the business and that the manager is blind and spavined if he doesn't take advantage of it. Should the manager issue a catalogue the advertising expert tells him that he has made the mistake of his life by not consulting him first. Thereupon he proceeds to rip the catalogue to pieces, declares that it is an incongruous hodgepodge, that it is a mere journeyman's job and that the cover design is enough to give a sober man the jim-jams. The poor manager feels that he never had thirty cents in his pocket at any one time in his life. He is astonished to learn that had the catalogue plan been presented to the expert before it was printed it would have been lifted upon the pedestal of art for the small consultation fee of $5. As an evidence of what an advertising expert can really do to expend a business when he lets himself loose, take the case of Rogers, Brown & Co., who discovered that they were dealers in forty kinds of iron ores as well as forty kinds of pig iron. All done in a single night. They never would have believed it had it not been put down in black and white. Why, the advertising expert blindfolded and with one hand tied behind him, can do more to expand a business than any dozen business men.

The seagoing tug Bryn Mawr was launched last week at the ship yard of Quigley, Davis & Dorp, Cooper's Point, near Philadelphia. The tug was built for Peter Wright & Sons, to be added to the Red Star service. The Bryn Mawr has a wooden hull and is 86 ft. long, 19½ ft. beam and 9½ ft. deep. This is the first vessel to be launched by Quigley, Davis & Dorp, who are a new firm of ship builders.

Cramps, Philadelphia, will launch the armored cruiser Colorado on April 9. She is the first of the great class of armored cruisers now building. Coupled with tremendous battery power she has the speed of an ocean liner. She is expected to steam 22 knots per hour. She will be 502 ft. long, 69 ft. 6 in. wide, and will draw, when completed, 24 ft. 6 in. of water.

SHIP BUILDING NOTES FROM SCOTLAND.

Glasgow, March 2.—The crisis in the ship building trade may now be considered over, for all the workers in the ship yards have gone to work again this week as if there had never been a ripple on the industrial waters. They are even working better than before the reduction, but this is in accordance with industrial experience. Every employer knows that his men are more industrious and painstaking when wages are on the downgrade than when they are on the upgrade. It is, indeed, generally believed in ship building circles that piece workers will not earn a penny less under the reduced rates than they were earning before. They will simply work a trifle harder and longer, and they can easily do that without over fatigue. The machinists have yet to settle with the Federation of Engineering Employers. The proposed conference was to have taken place on Monday last, but was postponed in consequence of the death of Mr. Alfred Sellicks, chairman of the executive council of the Amalgamated Society of Engineers. Mr. Sellicks was a very prominent person during the great strike of 1897-8, when he figured at the head of the men, as the late Col. Dyer figured at the head of the employers. Both the leading individuals in that great struggle have thus passed away, and both were probably victims of the fight, worn out by its immense strain and responsibility. In the midst of that heated controversy the federated employers got to know Mr. Sellicks as they had not previously known him, and got to respect and esteem him. The friendly relations which have, since 1898, existed between the federation and the trades unions in the engineering trade, were largely due to the tact and judgment of Mr. Sellicks. He was an able, honest and sagacious leader, whose death is a great loss to the Amalgamated Society of Engineers. But that society has several able men in its executive.

It is unfortunate that just as ship builders are getting down the cost of production in so far as the labor item is concerned—and some orders have already been reported since the wages question was adjusted—the prices of material should be taking an upward turn again. There has been within the last week quite a run upon pig iron warrants—caused, it is said, by American orders through London—and smelters have put up their prices all round. In consequence, steel ship plates, which have been languishing for some time at £5.10-, less 5 per cent, and have even been sold as low at £5 net, have been advanced to £.15-, less 5 per cent. This is calculated to check ship building business. In February there have been only 28,000 tons of new contracts booked, against 41,600 tons launched.

Great interest is naturally taken here in the purchase by the Canadian Pacific Railway Co of the River Line of Steamers. Many of these steamers were built here, and there have always been very close and active business relations between Scotland and Canada, though the Beaver steamers do not work with the Clyde. The deal, as at present reported, consists of fourteen steamers of from 5,000 to 9,000 tons each transferred by Elder, Dempster & Co. to the Canadian Pacific Railway Co., but remaining under the management of that firm in so far as business at this end is concerned. None of these vessels, I believe, is more than five of six years old, and two or three of them were only launched last year. The purchase price is said to be £1,500,000. To increase the service the Canadian Pacific intends to build immediately three steamers of 10,000 tons each, the contracts for which are to be placed on the Clyde.

CHAMBER OF COMMERCE OPPOSED TO SUBSIDIES.

At the annual meeting of the Chamber of Shipping two resolutions were submitted by Glasgow and Liverpool, urging upon the government to bring foreign ships loading or discharging cargoes or taking passengers in our ports under laws similar to those under which British ships had to work. In the discussion it was stated that foreign vessels constantly sinned in regard to the load line, and that was a matter which could not be passed over. The resolution was carried. Then Colonel Goffey (Liverpool) moved a resolution calling for the removal of foreign laws and regulations which exclude the British ship owners from the trades appropriated by various foreign powers to their own shipping in the "coasting trade." This motion was seconded by Mr. Bruce Murray (Glasgow), and adopted. And on the subject of subsidies the feeling of the chamber was expressed in the following resolution, which Mr. A. Atkinson (Hull) moved: "That this chamber notes with regret that there is a probability of subsidies being granted to cargo steamers in addition to mail steamers; this chamber is strongly of opinion that no such subsidies ought to be granted by the British government, but that they should be strictly confined to the securing of thoroughly efficient and adequate mail services; the subsidizing of cargo steamers would, in the opinion of this chamber, be fraught with the greatest injustice to existing non-subsidized British steamships, and would create monopolies of a most objectionable character." Mr. C. H. W. Wilson (Hull) seconded, and the motion was adopted. Later in the proceedings of the chamber the president of the board of trade, Mr. Gerald Balfour, said he was glad that in the universal growth the shipping industry had its full share. Referring to the Atlantic combine, he said the matter would no doubt form the subject of discussion in the house of commons. He did not propose to indulge in the pastime of dancing among eggs, as he saw Mr. Pirrie present, but having regard to what had occurred, and to certain arrangements he had been able to make with the Cunard company and the combine, he felt some confidence in saying he did not think the sequel would prove any serious injury to British interests or the interests of the British mercantile marine. He agreed that the restrictions imposed upon British shipping should be imposed upon foreign shipping. It could not be done all at once, but if the ship owners considered that it would be to their advantage that an inquiry should be instituted in regard to these matters, he could assure them the government would not stand in the way. These remarks by a minister have given great satisfaction in shipping circles.

FRENCH BOUNTY LAWS ARE A FAILURE.

The federation of French ship owners, which has recently been formed not as a co-partnery but as a defensive association, are preparing to take action on the bounty laws. They are a failure and there is a movement on foot to change them. Under the act passed last year a bounty of 65 francs per gross ton is paid to builders on all ships of over 100 tons, but owing to dearer material—ship plates are £8.5/- a ton—dearer engines, and heavy taxes and insurances, French-built ships are 35 per cent dearer than British-built ships. The ship owner can only afford to pay such prices because government recoups him out of navigation bounties. The ship owner has the choice of two bounties—the compensation d'armament and the prix de navigation. Under the first he gets for every day a vessel is in commission, up to 300 days per annum, 5 centimes per ton up to 2,000 tons, 4 centimes per ton from 2,000 to 3,000 tons, 3 centimes per ton from 3,000 to 4,000 tons, 2 centimes per ton above 4,000 tons. The annual payment on a vessel of 5,000 tons may thus be £2,280. Under the second system steamers of from 1,000 to 3,000 tons, and having a speed of 12 knots, get 1 franc 75 centimes per gross ton per 1,000 nautical miles, the compensation diminishing as the size increases, until the rate is 1 franc 50 centimes per gross ton per 1,000 nautical miles for vessels of 7,000 tons. The scale does not go beyond that, and no matter how much larger a vessel is the payment stands at 1.50. These rates apply only to the first year of a vessel's existence, and then diminish annually—4 centimes in the first four years, 8 centimes in the second four years, and 16 centimes in the third four years. On a vessel of 5,000 tons steaming 40,000 miles a year the payment would be £12,000 for the first year and £96,000 for the whole period of twelve years. Sailing ships are also eligible for this navigation bounty, but only on 1,000 tons of their registered tonnage. The gross tonnage of a French steamer is from 20 to 25 per cent more than that of a British ship of the same type. No vessel was ordered in France to reap the benefit of these bounties until October last, and then only six were placed. Two more were contracted for the following month, and a little later one large concern—the Chargeurs Reunis—ordered six. These, with 80,000 tons which had been launched, represented almost the 150,000 tons provided for in the vote, and owners proceeded to order vessels right and left. The 150,000 tons was reached on Dec. 17, but the demand continued. No fewer than fifty vessels of 165,000 tons—more than double the output of France in 1901—were ordered in December alone, and the aggregate now on which bounties have to be paid is 392,000 tons. The amount voted was £6,000,000 and the present estimated expenditure is £9,680,000. The ship owners are now moving to have the law altered, and the probability is that it will be altered, but there is a difference of opinion as to the shape the alteration should take. Some demand another vote, and some owners would rather have the building bounty increased at the expense of the other. Under the law as it stands the navigation bounty recoups the extra cost of building, but a vessel may be lost in the first of the twelve years in which the compensation should be earned.

COMMISSION ON SHIPPING QUESTION.

When it was found in the closing days of the last congress that the merchant marine committee of the house could not be induced to make a favorable report on the ship subsidy bill, it was thought congress would give consideration to another measure, a resolution providing for a joint committee of the two houses to consider the shipping question on lines other than the payment of subsidies. The proposed commission, according to the resolution, was to investigate our present policy of international navigation, to trace its effects upon our merchant marine, to consider how we may constitutionally encourage it in foreign trade and thereby regain our lost position at sea, and to report to the senate and house, respectively, identical bills calculated to effect with certainty a renewed development of American shipping power. The commission was to consist of seven members of the senate, four from the side of the majority and three from the side of the minority; and of ten members of the house, six from the side of the majority and four from the side of the minority, seventeen in all; to whom was to be added the president of the senate, who was to be chairman. The house resolution providing for this commission was introduced by Representative Green of Massachusetts and was favorably reported by the committee on merchant marine, but Speaker Henderson refused to give it consideration. A similar resolution in the senate did not get beyond the committee stage, but the understanding is that advocates of this commission will attempt to have it legislated for by the next congress.

Owing to local friction in the office of the inspectors of steam vessels at Chicago the secretary of the treasury has asked for the resignation of the following named officers: Stewart H. Moore, inspector of boilers; Charles A. Richardson, inspector of hulls, and John J. Ford, clerk.

BRITISH SHIPPING NOTES.

London, March 2, 1903.—Turning for the moment from the technicalities of ship building to large political issues raised by the mercantile marine, the first point of interest is the marine insurance bill, which has been introduced into the house of lords by the lord chancellor. Similar bills have been before parliament, one last session, which was blocked to the serious inconvenience of the interests concerned. Strong representations were made to the prime minister by the committee of Lloyds and the Institute of London Underwriters, with the result that the present measure has been officially introduced. Its full title is "an act for codifying the law relating to marine insurance," from which it will be seen that the measure aims rather at classifying and consolidating existing laws than at initiating anything in the shape of new legislation. This is all to the good; the law governing marine insurance is needlessly confused, and many attempts to arrive at simplification have hitherto been without success. The present law is contained for the most part in two acts passed in the reign of George III and three in the early part of the reign of Queen Victoria. These acts are now repealed, and the new codification will supplant them. General opinion is one of complete satisfaction.

"A bill for the codification of marine insurance law," said the manager of one of the largest marine assurance companies, "has been, off and on, before parliament for a number of years, and it is satisfactory to think that it is at last going to be passed. If I am not mistaken, such a bill was introduced by Lord Herschell some five or six years ago, but it was subsequently dropped, and though the subject has been brought up again time after time nothing has been done. The present measure is doubtless the outcome of the strong representations which have been made by Lloyd's and other powerful organizations to the premier. I have not had time to go through it clause by clause, but, so far as I am aware, the provisions are absolutely non-contentious."

"Then the bill is merely a codification, and will not effect any changes in marine insurance practice?"

"I should say yes to the first part of your question, but as regards the second, we shall have to wait and answer that by experience. All law is judge-made, or rather judge-expounded, and it is quite possible that future judicial decisions may to some extent modify the existing practice. Marine insurance is a rather complicated business, and there is generally a good deal of give and take in policies which it would puzzle the law to deal with. I observe that at the end of the lord chancellor's bill there is a schedule containing a 'form of policy,' which is presumably inserted for the guidance of those drawing up such documents. It is very interesting, no doubt, but quite without practical value. You see, in every insurable case there are so many special circumstances that clauses are piled on interminably, and in the end the skeleton policy is little more than a vehicle to convey the particular clauses."

"Can you mention any particular in which you consider the new bill will lead to changes of practice?"

"No, I must say that I cannot, out of hand. Indeed, without studying the bill carefully, and making exhaustive comparisons between the clauses of it and standing judicial decisions, I should be very slow to pass any criticism on it. I believe there has been some grumbling that the bill has been framed without the assistance of practical insurance men, and that the people responsible for it know nothing of the subject, but on this point I will say nothing. I suppose all class bills are liable to the same criticism. On the whole, I think you may say that insurance interests are satisfied with the bill."

SHIP OWNERS' GRIEVANCES.

Any opinion emanating from the Liverpool Steamship Owners' Association must, of course, meet with every consideration. The latest from them adverts to the protection and assistance given to foreign competitors by the laws of their own countries, and also by the unfair advantages given to foreign ships in British ports. The report proceeds:

"So unequal a fight cannot be long maintained, and it rests with the nation to decide whether the British ship owner is to be driven from the field by the combined forces of the foreign ship owner, thus working with the help of both their own governments and of the British government, or our laws are to be so altered as to place the British ship owner in a position of equality with his foreign competitors, in at least the ports of the empire." Having dealt with the position generally the association suggests that the following alterations should be made in the existing law in the interests of the general trade of the country:

The powers of making the safety regulations should be placed in the hands of the government, assisted by a committee of experts, representing the shipping interests, and the regulations should be so framed as to encourage and not hamper improvement.

British safety regulations should apply to all vessels trading to ports in the United Kingdom or any British possession.

The admiralty should recognize its responsibilities to the full for loss resulting from negligence in the navigation of his majesty's ships.

The ship owner should be placed in as good a position as his foreign competitors, with reference to the extent of his liability for the negligence of his servants.

Foreign vessels within the jurisdiction of British courts must be made answerable to such courts in all claims in which British subjects are interested.

The country should take over the cost of lighting the coast, and the management of the light house service should be placed in the hands of the government, assisted by a committee of experts representing the ship owners, merchants, underwriters, officers and crews.

THE MANCHESTER SHIP-CANAL.

The half-yearly report of the Manchester ship-canal reached me a few days ago and I have been struck with the increase in the traffic done. I extract the following figures as showing how quickly the canal is marching towards financial success:

	Six months ended Dec. 31, 1901 tons.	Six months ended Dec. 31, 1902. tons.
Sea-borne traffic	1,422,089	1,679,825
Barge traffic	129,155	147,871
Total	1,551,244	1,827,696

The following is a comparison of the traffic for the nine years during which the ship-canal has been open:

	Sea-borne traffic, tons	Barge traffic, tons	Total tons.
1894	686,158	239,501	925,659
1895	1,087,443	271,432	1,358,875
1896	1,509,658	316,579	1,826,237
1897	1,700,479	365,336	2,065,815
1898	2,218,005	377,580	2,595,585
1899	2,429,168	348,940	2,778,108
1900	2,784,843	275,673	3,060,516
1901	2,684,833	257,560	2,942,393
1902	3,137,348	280,711	3,418,059

ATLANTIC CASUALTIES.

The effects of the recent severe weather in the Atlantic are to be seen in the casualties to coal steamers outward bound to the United States. The Danish steamer Cimbria, from Copenhagen and Blyth to Boston, has had to put back to Stornoway with serious deck damage. She will go to Greenock for repairs. The new British steamer Oakwood, 4,119 tons, and insured for £50,000, has put in at Moville leaky. She was from the Tyne to Boston. A third vessel, the British steamer Monadnock (Blyth to Boston), 4,275 tons, built in 1902, and insured for £42,000, recently put into Stornoway with weather damage, and has now gone aground near Tobermory while on her way to Greenock. The prospects of floating her are favorable. All these steamers left between the 12th and 17th of February. When one adds to these and other minor casualties the almost certain total loss of the Elder-Dempster steamer Palmas, also bound with coal for Boston, it will be evident that the apprehensions of those who anticipated serious risks from the unusual North Atlantic coal traffic in winter were fully justified.

The hopes of those underwriters who expected to get something substantial by way of salvage from the Manchester Merchant's cotton are evidently to be disappointed. The vessel's masts have all gone and she is rapidly breaking up. Planks and cotton are being washed ashore at Dingle bay. The recent gale has finished off the vessel, as it has the ship Helga, which was wrecked not far off.

REVISION OF BOILER REGULATIONS.

Just previous to the adjournment of the last congress the American Boiler Manufacturers' Association caused to be introduced in both house and senate a bill providing for the creation of a commission to revise the laws relating to the construction, installation and inspection of steam boilers. It is agreed that many of the provisions of law relating to marine boiler inspection have become antiquated and that in some cases these provisions actually militate against the best modern materials and the best practice on the part of manufacturers. The appointment of a commission to suggest changes in the government regulations was favored by the supervising inspectors of steam vessels, by the secretary of the treasury, who exercises supervision over the inspection service, and by members of the senate and house who are best posted in maritime matters. The bill was introduced very late in the session, however, and when it reached the merchant marine committee of the house members of that committee claimed that the secretary of the treasury had power to appoint such a commission and that legislative action was not necessary. Now the boiler manufacturers are to take the matter up with the secretary of the treasury, but they fear some delay on account of the organization of the new department of commerce, which will take over, after June 30, the steamboat inspection service with other bureaus of the treasury department.

The Buffalo Dredging Co. has secured the contract for building the pier at Sodus bay and the breakwater at Cape Vincent. Both contracts call for the construction of 300 ft. of work, the former to cost $21,000 and the latter $43,065.

Ship masters are agitating a new harbor of refuge or breakwater on Lake Huron near Rogers City, Mich. There is practically no harbor from Thunder Bay island to the Straits of Mackinac.

NEW LAWS REGARDING PILOTS.

Although the supervising inspectors of steam vessels at their last meeting in Washington refused to wipe out the regulation that deprives a lake master of license for ocean service, no matter how creditably he might pass examination on that score, they were nevertheless inclined to modify the law and have changed matters so that an examination will be given to lake masters on the seaboard for chief mate and with one year's experience as chief mate advancement may be had to the position of master. New paragraphs of the regulations in this regard are:

"Any person who has had three years' actual practical experience as master of steam vessels of 1,000 gross tons and upward on the great lakes, and can produce documentary evidence of the fact, may be examined for license as chief mate of ocean steamers; and after having had one year's actual practical experience as chief mate of ocean steamers of 1,000 gross tons and upward, may be examined for license as master of ocean steamers; and any person who has had one year's actual practical experience as first-class pilot on steamers of 1,000 gross tons and upward on the great lakes may be examined for license as chief mate of ocean steamers; and, after having had one year's actual practical experience as chief mate of ocean steamers of 1,000 gross tons and upward may be examined for license as master of ocean steamers, such experience to be immediately preceding the application for examination.

"Any person holding a license as master of lake, bay, and sound steamers may have the same indorsed thereon allowing him to act as master of steamers upon the waters of the Atlantic coast and the Gulf of Mexico, provided that the applicant has had at least one year's experience as mate, quartermaster, or wheelsman of steam vessels upon the waters of the Atlantic coast or the Gulf of Mexico, which experience must have been obtained within three years preceding his application for such indorsement, and the fact must be verified by satisfactory documentary evidence to be filed in the office of the local inspectors; and the applicant shall only be subjected to such examination in writing as shall satisfy the local inspectors that he is a competent coast pilot, capable of navigating the steamer. Inspectors shall state in the indorsement on the license the waters coastwise that the applicant is qualified to act upon as master."

Other new regulations regarding pilots adopted by the board are as follows:

"Any applicant for original license to act as master or mate of steam pilot boats, or of steamers navigating the waters of the whaling grounds in the Alaskan seas, or of steamers engaged exclusively in the business of whale fishing, or of steamers engaged in the Atlantic, Pacific or Gulf coast fisheries, or of steam or sail vessels navigating between ports of the Hawaiian islands, or between ports of the island of Porto Rico, must have had at least three years' experience in the deck department of such steamers, which fact must be verified by documentary evidence; and such applicant shall only be subjected to such examination as shall satisfy the inspectors that the applicant is a competent coast pilot, capable of navigating such vessels. It is provided, that any person who has had at least five years' experience on sail vessels licensed in the fisheries of the United States, two years of which have been as master and mate of such sailing vessels, may be examined for license as master or mate of steam fishing vessels to be employed exclusively in the Atlantic, Pacific, and Gulf coast fisheries. The licenses issued under this section shall state in the body thereof, 'for coastwise only,' Pacific or Atlantic coast, as the case may be, and between what ports on either of said coasts. It is further provided, that said master's or mate's license may be indorsed as pilot on such inland waters on the above-named coasts, as the local inspectors at the various ports may find the holder qualified to act on as pilot, after examination by the local inspectors, such examination to be in writing and preserved in the files of the inspectors' offices.

"Whenever the owner or sailing master of steam or sailing yachts, who has had three years' experience on board such yachts, applies for license to act as pilot of steam yachts, the local inspectors shall examine the applicant in writing in regard to his knowledge in handling such vessels, and familiarity with the lights, lighthouses, channels, buoys, obstructions, courses and distances between certain points in the waters within the local inspection district in which the applicant is examined, and shall also examine him as to his knowledge of the pilot rules for inland waters, the running and anchor lights, fog signals, the use of the lead line, signal bells between the engine room and pilot house, and the general rules and regulations for steam vessels. If the local inspectors are satisfied after such examination of the applicant's ability, a pilot's license for steam yachts may be issued to him for the waters covered by the local inspection district in which said license is issued, which license may be indorsed to include the inland waters of other local inspection districts by the local inspectors thereof, if satisfied, after examination, that the applicant is qualified therefor.

"Whenever the owner or sailing master of a steam or sailing yacht of over 100 gross tons, who has had three years' experience in sailing such vessels, applies for a license authorizing him to act as master of steam yachts for coastwise and ocean navigation, the local inspectors shall examine the applicant as to his knowledge of the rules of the road, fog signals, signal lights, inland and international; the use of the lead and line, the use of the patent and chip logs, the compass, variation and deviation of the compass, the use of the drag, the use of oil during storms, bell signals between pilot house and engine room, handling of steam vessels, laws of storms, course and distance by chart, keeping the log book, middle latitude sailing, Mercator's sailing, method of obtaining latitude and longitude by dead-reckoning, latitude by meridian altitude of either the sun, moon, or stars; longitude by chronometer (time sights). Practical problems will be given in the subjects of latitude and longitude. The examination shall be in writing, which shall be kept on file in the office of the local inspectors. If said examination is satisfactory to the local inspectors, they shall issue to the applicant a master's license authorizing him to discharge the duties of master of steam yachts, either for coastwise or ocean navigation."

MONTHLY SUMMARY OF NAVAL CONSTRUCTION.

The monthly summary of naval construction shows that steady progress is being made upon all vessels under construction. Interest will from now on center in the relative progress of the sister battleships, one of which is building at the New York navy yard and the other at the yard of the Newport News Ship Building & Dry Dock Co. So far the Newport News company is ahead, for it is credited with 3 per cent for the Louisiana as against 1 per cent for the Connecticut, building at the navy yard. Following is the summary:

Name.	Building at	Degree of completion. Per Cent. Feb. 1.	Mar. 1.
	Battleships.		
Missouri.....	Newport News Co.	84	87
Ohio.....	Union Iron Works	69	70
Virginia.....	Newport News Co.	18	21
Nebraska.....	Moran Bros. Co.	15	16
Georgia.....	Bath Iron Works	20	21
New Jersey.....	Fore River Ship & Engine Co.	26	29
Rhode Island....	Fore River Ship & Engine Co.	26	28
Connecticut.....	Navy Yard, New York	1	1
Louisiana.....	Newport News Co.	1	3
	Armored Cruisers.		
Pennsylvania....	Cramp & Sons	42	45
West Virginia...	Newport News Co.	44	45
California.....	Union Iron Works	20	22
Colorado.....	Cramp & Sons	46	48
Maryland.....	Newport News Co.	43	44
South Dakota...	Union Iron Works	22	24
Tennessee.....	Cramp & Sons	0	0
Washington.....	New York Ship Building Co	0	0
	Protected Cruisers.		
Denver.....	Neafie & Levy	86	86
Des Moines.....	Fore River Ship & Engine Co.	79	80
Chattanooga.....	Lewis Nixon	68	68
Galveston.....	Wm. R. Trigg Co.	66	66
Tacoma.....	Union Iron Works	64	66
Cleveland.....	Bath Iron Works	91	92
St. Louis.....	Neafie & Levy	14	14
Milwaukee.....	Union Iron Works	10	12
Charleston.....	Newport News Co.	27	31
	Monitors.		
Florida.....	Lewis Nixon	97	98
	Torpedo Boat Destroyers.		
Hopkins.....	Harlan & Hollingsworth Co.	95	96
Hull.....	Harlan & Hollingsworth Co.	99	99
Lawrence.....	Fore River Ship & Engine Co.	99	99
McDonough.....	Fore River Ship & Engine Co.	98	98
	Torpedo Boats.		
Stringham.....	Harlan & Hollingsworth Co.	98	98
Goldsborough...	Wolff & Zwicker	99	99
Blakely.....	Geo. Lawley & Son	99	99
Nicholson.....	Lewis Nixon	98	98
O'Brien.....	Lewis Nixon	98	98
Tingey.....	Columbian Iron Works	90	94
	Submarine Torpedo Boats.		
Plunger.....	Lewis Nixon	99	99
Grampus.....	Union Iron Works	92	92
Pike.....	Union Iron Works	88	89
Porpoise.....	Lewis Nixon	99	99
Shark.....	Lewis Nixon	98	99
	Steel Tugs.		
Pentucket.....	Navy Yard, Boston	10	33
Steel Tug.....	Navy Yard, Mare Island	0	0

The Marine Firemen, Oilers & Watertenders' Protective Association of the great lakes elected the following named officers for 1903: James Stewart, president; Michael Casey, secretary; James Shelly, clerk in office; B. C. Ralph, treasurer; R. B. Mahany, attorney; members of executive committee, Cleveland branch, John Fisher and Thomas Kelly; Chicago branch, David Kiffin and James Kennedy; South Chicago branch, Arthur E. Brady; Conneaut branch, John Coakley; Ashtabula branch, Thomas Brunner; Detroit branch, Michael Galvin; Milwaukee branch, Edward Ryan; Duluth branch, William Jones; Toledo branch, David King.

SHIP BUILDING AT NEWPORT NEWS.

Newport News, Va., March 11.—Baltimore ship building interests are looking for a suitable site on or near Hampton Roads with a view of building an up-to-date ship yard. Whether or not one of the plants now located at Baltimore will be moved and enlarged is not known. In view of advices from that city about the consolidation of the interests of the Spedden ship yard, the Skinner ship yard and the Baltimore Dry Dock Co., it is possible that a new plant will be established. For several days a representative of Baltimore capitalists has been in this vicinity and it is known that he secured considerable data regarding the proposed yard at Sewell's point, across Hampton Roads from this city. Officers of the Hampton Roads Ship Building & Dry Dock Co., which is backing the Sewell's point project, deny that their land is for sale and furthermore maintain that work will be started inside of two months on a marine railway, which will be the first thing installed. The Spedden company denies that it is interested in establishing a new plant on Hampton Roads, but it is known that certain experts who are identified with this company and the Baltimore Dry Dock Co. some time ago interested themselves in a proposition to locate on Hampton Roads. Newport News citizens who recently made an open offer of a site to any person or firm who would build a plant to employ at lesat 1,500 men now permit the use of their names. They are D. S. Jones, president of the city council and one of the wealthiest men on the Virginia peninsula, and D. G. Smith, clerk of courts of the city, who is also a large property owner. The 150 acres they offer free, without any condition other than the guarantee to employ so many men and establish an up-to-date plant, is easily worth $50,000 and is situated only a short distance above the Newport News ship yard on deep water and within a very short distance of the main line of the Chesapeake & Ohio Railroad. Speaking of his offer, Mr. Jones said: "We are prompted solely by a desire to increase the industrial investment of Newport News and to bring a plant that will employ at least 1,500 hands. There are no strings to this offer, other than a guarantee that so many men will be employed and that up-to-date buildings and machinery will be installed. The land is free to bona fide investors."

April 16 has been mentioned as the probable date for the launching of the new armored cruiser West Virginia, but Gen. Supt. W. A. Post of the Newport News Ship Building & Dry Dock Co. says that no final arrangements have been made with the navy department, and until this is done the date will not be announced. Miss Katherine White of West Virginia, daughter of the governor, will christen the big ship, which will be the largest warship launched for the United States navy up to this time.

The Old Dominion steamship Monroe, which will be the queen of the fleet and will cost in the neighborhood of $700,000 when completed, will be given her builder's trial March 20. It is probable that several officials of the line will come here to make the trip to the Capes and return.

Freight rates from the north to the cities and adjacent to Hampton Roads will be advanced in a few weeks. The exact date has not been announced. The steamship lines in the agreement are the Old Dominion, Merchants & Miners, Clyde Line and Chesapeake Line. Bound with these lines in the agreement are the Chesapeake & Ohio, Baltimore & Ohio, Norfolk & Western and Southern railways. The advance was determined upon at a meeting held Feb. 18 with respect to what is known as class freights, and several days ago an increase in commodity rates was agreed upon. In the latter case the advance will hardly exceed 3 cents a hundred pounds. The business affected by the change will be that going from New York, Boston, Philadelphia and Baltimore to Newport News, Norfolk, Richmond and Petersburg.

Capt. A. S. Harney, who has been actively engaged with the Old Dominion Steamship Co. for the past twenty-five years, has been appointed chief stevedore of the company at Newport News to succeed Capt. A. B. Mallett. Capt. Mallett recently tendered his resignation after thirty-one years of valuable and efficient service with the Old Dominion in several capacities, among them master of several of the company's ocean liners, before he took up his residence here nineteen years ago. Capt. Mallett was led to sever his active relations with the company by advanced age and ill health. The officers were reluctant to accept his resignation on account of his long association with the line. Capt. Atwell Guy, who has been first officer and pilot of the steamer Berkley, will succeed Capt. Harney as master. He has been piloting on the James river for twenty-seven years. Capt. James R. Shirley will succeed Capt. Guy as first officer and pilot of the Berkley.

It is reported that the Pacific Mail Steamship Co. will soon be in the market for two monster steamships similar to but larger than the Korea and Siberia, which were built here for the Pacific trade. Competition of the China Commercial Co. and the Hill steamers from Seattle is said to be responsible for the Pacific Mail's activity. Gen. Mgr. R. P. Schwerin, who is well known here, is now in the east for the purpose of looking at several large ships that are in course of construction. He will make an effort to get the two 600-ft. ships building at Camden for the Atlantic Transport Line. Failing in buying two leviathans about completed, it is reported that the Pacific Mail will order two new ships to be built. In that event the Newport News ship yard will probably be a bidder.

The battleship Maine is now on her way south to join the battleship division of the North Atlantic squadron. She took on 900 tons of coal here. The monitor Puritan and the training ship Lancaster, both in from Yorktown, took on coal. The cruiser Topeka arrived at Old Point from Charleston and proceeded to Boston to take part in a celebration to be held there. The torpedo boat destroyers Whipple and Worden were given successful speed trials over the Barren island course in Chesapeake bay. The Dolphin, after completing repairs at the navy yard, sailed out of Hampton Roads for Charleston, where she took aboard Secretary Moody and his party. There was general regret among the naval officers on this station when Rear-Admiral Cotton was detached from command and ordered to command of the European station to succeed Rear-Admiral Crowninshield. Capt. Harrington, who now becomes a rear-admiral by Crowninshield's retirement, will arrive at the navy yard in the next week to take command. Elaborate preparations are being made at Old Point and in Newport News and Norfolk for the arrival of the battleship division of the North Atlantic squadron and it is predicted that the season during the stay of the naval officers will be the most brilliant in several years. Capt. Cowles, who has been assigned to command the battleship Missouri, is expected to arrive early in the summer to remain until the ship goes in commission. Lieut. Com'dr. W. Strother Smith, who was stationed at the ship yard several years ago, has been ordered back and has entered upon his duties as assistant to Capt. Inch, senior inspector of machinery. Congressman Maynard says he has received assurances that one of the two new training ships for the navy will be built at the navy yard. The main and fore masts for the new cruiser Galveston, which is building at the Trigg ship yard, Richmond, have been completed at the navy yard and are being fitted with tops. They will soon be shipped. The repairs on the torpedo boat Gwynn, which sustained damages by collision with the pier at Old Point, have been completed.

FULTON'S SUBMARINE.

It is generally known, says the Matin of Paris, that the first submarine boat was invented by Fulton but it is not generally known that there was anything practical in his invention. This was an error, as shown in two recent publications from a retired lieutenant named Duboc of the French navy and from M. Fontin, the librarian of the ministry of marine at Paris. The latter, after a careful perusal of the archives at his disposal, quotes several official reports from witnesses of the performances of Fulton's submarine boat, and concludes by saying with Lieut. Duboc that "the submarine of 100 years ago presented very nearly the principles adopted in modern submarines and also in the Whitehead torpedo." The Nautilus of Fulton accomplished feats of great daring.

Fulton, supported by the great savans Monge and Laplace, had to fight against the bureaus of the marine office, against the minister, Admiral Decrès, and against "that ass, the first consul, who then missed his fortune," meaning by this the certainty of crossing to England with his army at the camp of Boulogne. In August, 1801, Minister Decrès gave orders for sending away from Brest Fulton, with his boat and his torpedo, though he had used them successfully to blow up a derelict in the presence of the French officials. He experienced similar treatment in England, where he went after his failure in France, and where, under the eyes of Admiral Holloway, Pitt and Lord Melville, Fulton's torpedo boat blew up the brig Dorothée, which was thrown 6 ft. in the air and fell back broken in two. But that treatment was to be expected from the greatest naval power of the world, and when Fulton, proud of his success, presented himself to the first lord of the admiralty the latter said to him: "Pitt is the greatest fool that has ever existed for encouraging a kind of war quite useless to those who are masters of the sea, and which would be deprived of this supremacy if that method of warfare succeeded."

Fulton with his Nautilus measuring 6½ meters in length and 2¼ meters width, went down the Seine to Havre, using a screw moved by hand. The boat went down at will, through the introduction of a certain quantity of water; it went up again through the expulsion of the liquid ballast with a pump. Later he adapted at the bow a screw with horizontal blades, which allowed his boat to maintain itself in a constant level. There were other improvements. Fulton knew the depth in which he was, thanks to a kind of barometer registering the weight of the corresponding water columns. The position of the enemy was observed through a cupola having ports and raised just on the level of the water. The crew was composed of three men, captain included. They could stay under water "with two lighted candles" theoretically during six hours and practically three hours. To blow up a vessel the Nautilus went underneath it and sent into it a barbed harpoon to which was attached a torpedo placed 100 meters backward. The submarine boat had a mast and a sail, for its progress on the surface, and they could be drawn inside the vessel in a few moments owing to an ingenious mechanism.

At the office of the United States life-saving service, Washington, sealed proposals will be received until March 20 for the construction of a station at the south pier of the Chicago river at the easterly breakwater.

THE OUTLOOK ON THE LAKES

Representatives of the iron ore companies have undertaken a canvass for the sale of ore on the advanced schedule of prices that has been expected by all parties concerned, but they have been out only a few days and their dealings with the ore consumers have not as yet reached a stage that would warrant expectation of immediate action towards closing lake freight contracts. The new classification of the ores will probably cause the furnacemen to go slow in providing for their wants. Nothing new can therefore be said of the lake freight situation. It is generally agreed that the coal shippers should bear a large portion of extra lake freight required on account of increased cost of operating the vessels, but to use a homely phrase "they don't have to" and will probably pay only such rates as must be paid. Coal is a "short end" of the lake trade and the coal shippers know of the advantage they will derive from the surplus of vessel capacity that drives big vessels into the coal trade.

Vessel owners of the lakes who have been scanning very closely the reports of contracts made by the executive committee of the Lake Carriers' Association with the labor unions are, of course, inclined to the opinion that the men secured practically all they asked for, but there is great relief, nevertheless, in the feeling that everything excepting the position of the harbor tugmen seems clear from a labor standpoint, and the hope on all hands is that the settlement with other labor unions will be a strong factor in bringing about an agreement between the tugmen and their employers.

It is still expected that the Gilchrest fleet of vessels will, as in the past, be enrolled in the Lake Carriers' Association before the season of navigation opens, as it is not probable that the management of this large fleet can afford to hold out against the new strength of the vessel owners' organization. In the past there have been a few owners who have enjoyed, without paying dues to the association, the advantages of aids to navigation and other improvements secured by united effort, but it would seem that this year the arrangements with the labor unions will work the other way in cases of this kind. It is understood that vessel owners who have withdrawn from the association and who are thought to have done so for the purpose of avoiding dues will be called upon to pay all back dues before their vessels are reinstated.

One clause in the arguments entered into between the executive committee of the Lake Carriers' and labor unions has been the subject of considerable comment. This is the concession to wheelsmen and lookouts of 25 cents an hour extra compensation for all work done loading or unloading in port during their watch below. Members of the committee say they are sure that this agreement will not cause unusual trouble, as it is to apply only to wheelsmen and lookouts and only while loading or unloading—not at the Sault, in the runs, or while picking up tows. They argue that the help of a wheelsman or lookout who has done his share of work can be dispensed with for a few hours in port, except under extreme circumstances. The men protested that they do not want to be under the necessity of earning this extra 25 cents. They would really rather not get it than get it, and the executive committee thinks that mates can so manage their crews that it will rarely have to be paid. The condition which this extra 25 cents per hour is expected to remedy is this: When a vessel has entered port to load or unload, mates have sometimes caused the men to continue at work until they were again outside, and it is claimed that in this way watchmen and wheelsmen, who say they suffer most on this score, have been unnecessarily held for very long periods without sleep. It is represented that those in charge have often in this way subjected the men to great fatigue.

WAGES OF LABOR ON LAKE VESSELS.

The executive committee of the Lake Carriers' Association has already demonstrated the practicability of the scheme of reorganization as a compact working force, for, during its session at Detroit last week, it closed contracts for the coming season with all men to be employed aboard the vessels excepting the firemen, oilers and water tenders, who are in one union and who will be met in Cleveland on Wednesday next. Wages of the engineers were practically fixed some time ago when a schedule from the engineers was accepted for the Steel Corporation vessels, but a meeting with President Geo. Uhler of the engineers' organization is expected shortly. There were no dealings with the union representatives in advancing the wages of mates, as the lake carriers hold that alike to the captain the mate should be regarded in the light of an executive on ship board—a representative of the owner's interests. But with delegates from the unions representing other branches of labor the whole ground was thoroughly gone over in Detroit and everything adjusted amicably. The men have agreed not to enter into sympathetic strikes, and should any differences arise they are to be settled by arbitration, the men meanwhile continuing at work. Contracts were closed for the season with the Buffalo grain scoopers, the marine cooks and stewards, and the Seamen's union. Briefly these agreements are as follows:

THE SEAMEN'S UNION.

Watchmen, wheelsmen and lookouts (the complement required on steam vessels by the inspection laws) are to receive $45 per month from the opening of navigation until Oct. 1, when they are to receive $65 per month until the close of navigation.

Ordinary seamen (and by this term is meant those who were formerly known as deckhands) are to receive $25 per month from the opening of navigation until October 1, when they are to receive $37.50 per month for the balance of the season.

Mates on barges are to receive not less than $10 per month more than the seamen on the same vessels, and "donkey boiler" men $5 per month more than seamen.

Able-bodied seamen on barges are to receive $45 per month until Oct. 1, and $65 per month from Oct. 1 to the close of navigation.

Engineers on tow barges are to receive the same wages as the mates on the same barges.

SCHEDULE FOR MATES.

The committee decided voluntarily to increase the wages of first and second mates as follows:

	1903	1902
First mates, first-class steamers	$115	$96
Second mates, first-class steamers	80	66
First mates, second-class steamers	100	84
Second mates, second-class steamers	70	54
First mates, third-class steamers	90	78

GRAIN SCOOPERS' UNION OF BUFFALO.

The wage scale for shoveling grain will be $2.12½ cents per 1,000 bushels, except where the cargo is started after 6 p. m. Saturday, or any time up to 7 a. m. Monday, or coming partially unloaded from another elevator after 6 p. m. Saturday. Such cargo shall be paid for at the rate of $3.12½ per 1,000 bushels. It is understood, however, that all cargoes started prior to 6 p. m. Saturday and worked continuously at the same elevator shall be unloaded at the regular rate. Last year's rate was $2 per 1,000 bushels and vessels might start to unload as late as 10 o'clock Saturday night without additional charge. The compensation for handling wet grain or lightering cargoes when vessels are aground will be 35 cents per hour. For straight shoveling, which constitutes the great bulk of the work, this is an increase of 6 per cent over last year.

AGREEMENT WITH THE COOKS.

The scale for marine cooks during the season is: Chief cooks, $66 per month until Oct. 1 and $86 thereafter; second cooks, $30 to Oct. 1 and $37.50 thereafter; porters, $25 until Oct. 1 and $35 thereafter, except on package freighters, where they are to receive the same as second cooks. The cooks are to receive 25 cents per day for each passenger on freighters except on boats carrying porters.

OTHER DETAILS.

In all the agreements it is understood that the only holidays to be observed are Decoration day, Fourth of July, Labor day and Thanksgiving day. Christmas and New Years do not, of course, come within the navigation season.

Wheelsmen and lookouts are to be given 25 cents an hour extra compensation for all work done loading or unloading in port during their watch below.

The shipping master's position is to be changed to that of shipping commissioner. A. R. Rumsey is to be retained as chief shipping commissioner, and it is expected that he will have at the different ports about the same number of assistants as he has had in the past. The shipping commissioner and his assistants will look after the distribution of men to the vessels as in the past but working in conjunction with the union officials except at such times as it may be impossible to get union men.

All business of the executive committee of the Lake Carriers' will be conducted from offices in the Western Reserve building, Cleveland, where Capt. Geo. P. McKay, treasurer, will make his headquarters.

At Buffalo only members of local No. 109 are to be employed when they can be secured. Boss scoopers are to be appointed by

the superintendent from members of the union and the president of the local is to appoint all time keepers.

To avoid any misunderstanding as to who is actually in charge of the vessel the committee decided to insert the following clause into all contracts: "That all employes of the boats should promptly and cheerfully obey all orders issued by the captain."

WAGES ON THE LUMBER CARRIERS.

The Lumber Carriers' Association has also closed contracts with the seamen's union and the marine cooks and stewards' union. The wheelsmen and lookouts are to receive $45 up to Oct. 1 and $65 thereafter. Ordinary seamen are to get $25 per month up to Oct. 1 and $37.50 thereafter. Able-bodied seamen on tow barges are to get $45 per month up to Oct. 1 and $65 per month thereafter. Mates on barges are to receive $10 a month more than seamen on the same vessels. Steamers carrying 600,000 ft. of pine and over are to carry two wheelsmen, two lookouts and two ordinary seamen. The wages on schooners are to be $2 per day to Sept. 1; $2.25 per day for the month of September; and $2.50 per day for the balance of the season. Mates' wages are to be 25 cents per day over the seamen. All vessels in the salt, alabaster, stone or railroad iron trade are to pay the men 25 cents per hour when working at cargo, at all times over and above the regular wages. On steamers and barges, when loading lumber, cedar, hemlock or pulp wood, overtime is to be the same as longshoremen—ten hours to constitute a day's work and to be from 7 a. m. to 6 p. m., and one hour for dinner. Overtime, moving the vessel, or doing other work than loading, while at the loading port at the noon hour, before 7 a. m. or after 6 p. m., to be paid for at the rate of 25 cents per hour.

With the cooks it was decided to pay the same wages as obtained last year but that no more women are to be employed. The women, however, who have been engaged for the season of 1903 are to be retained.

THAT GOVERNMENT DREDGE.

It appears that Attorney General Knox holds that the act passed last year by congress authorizing the secretary of war to build a dredge for harbor work on Lake Erie is mandatory and that the secretary will therefore be required to build it. The act authorized the secretary to build the dredge but there was doubt as to whether it was obligatory upon him to do so. The fact that the secretary, who is himself one of the foremost lawyers in the country, would send the act to the attorney general for an opinion, would imply that he was not personally in favor of building a dredge. However, the attorney general holds that the act directs him to do so, and it is probable therefore that if protest from the dredging interests is not found too formidable, there will be a government dredge on Lake Erie. This is a circumstance which is much to be regretted, for it is a direct invasion into private, legitimate enterprise by the federal authority. Carried to its extreme it would supersede the rights of individuals and subvert ambition altogether. It has not even the excuse of economy, for it is undoubtedly true that men whose business is dredging can dredge more cheaply than any of the dock companies or other business concerns that have occasion to employ dredgers, to say nothing of the added cost that attends all work which the government does on its own account. This government dredging is going to work out at a costly figure. The lakes have had examples of it in the past, notably in the case of dredges bought by one of the United States engineers a few years ago for work on Lake Michigan. The government officials are not concerned in the inexorable law of profit and loss which makes a private contractor forever keep his eye upon the cost sheet. When the year's business is reckoned up it will be found that the public has paid an extravagant sum for its dredging. The strength of a nation lies in its traders and the protection of the public in competition. Were there an unusual profit in the dredging business there would be more engaged in it. It is a business which it is impossible to monopolize, for it has no native resources which can be controlled. Anyone with a few dollars can go into the dredging business. The argument that a combination exists among the dredging companies is no argument whatever, for the dredging companies, singly or combined, cannot hope to extract an unusual profit from the business, and in any event their charge would undoubtedly be lower than the cost of similar work under government methods. Capital is very eager after unusual profits and always will contest the issue whenever they are to be obtained—unless prevented by a monopoly of the raw material, which, of course, cannot obtain in this case. No one can monopolize dredges. No one who has engaged in the dredging business on the lakes has become wealthy. It is certainly strange, therefore, that Senator Hanna, who in all his business career has stood for liberal returns in all lines of industry, and whose associates managing the several lake industries in which he is still interested have the same reputation, should be opposing the dredging companies in this matter. The claim that the dredge is required by the government for special work at Ashtabula, Fairport and other harbors of Lake Erie does not from the standpoint of anyone disinterested seem well founded. There are a sufficient variety of dredges to do the work—expeditiously if ordinary provision is made in that regard—and if there are not, private enterprise stands ready to build them.

DULUTH ITEMS.

Duluth, Minn., March 11.—Ore docks completed and planned, with the addition of the new construction credited to the United States Steel Corporation, will give a shipping possibility for the head of the lakes of about 20,000,000 tons, if delays are reduced to a minimum. The Steel Corporation has set aside funds for the completion of No. 3 dock of the Duluth, Mesabi & Northern at Duluth, building it out to the dock line, 1,100 ft. of new dock, and increasing its storage capacity to 80,000 gross tons. It has also set aside money for the repair and enlargement of No. 3 dock at Two Harbors.

A second engine crane has arrived at the yard of the Superior Ship Building Co. and is set up. Berths for two boats have been extemporized to the north of the punch sheds, and this crane will be used for this part of the yard. Plating has been started on one of the Tomlinson boats and the other large one is fast taking shape. The keels have been laid and bottom frames are in for the two St. Lawrence ships building here.

The Duluth lodge of the order of Elks has started a subscription to raise a fund for the relief of the widow and child of the late B. B. Inman, who died in Milwaukee last month and was buried at Duluth. An investigation of the captain's affairs discloses the fact that he died without leaving his family any provision for the future and Mrs. Inman and the little one are both in delicate health. At one time the captain was very well off, a little while after starting the tug business at Duluth, but that was all lost, and more, with the recurrence of hard times. Capt. Inman was very well known all over the lakes and had a host of friends. Remittances may be made to the secretary of the order of Elks or to Mr. D. T. Helm, treasurer of the B. B. Inman relief fund, Duluth.

CONDITION OF ICE ON THE LAKES.

At no time in recent years have the conditions of weather seemed to favor an early opening of navigation as they do at present. Still it is yet too early for any positive predictions. Norman B. Conger, inspector and marine agent of the weather bureau at Detroit, writes under date of March 11 that the reports from the regular and display stations of the bureau on the lakes indicate that the ice over extreme western Lake Superior has decreased some in size of fields, but the harbor ice at Duluth remains firm. Over the eastern portion of the lake the fields are large and extend out of sight. These fields moved out from the shore on the 9th. At Sault Ste. Marie the ice has softened under influence of warm weather and rain of the past week, and the ice is in about the same condition as reported last year at this time. The conditions are about the same in Mud lake; open water extends from Pipe island to Lake Huron. The ice over the southern end of Green bay is softening and breaking up. It remains fairly solid over the northern portion. No ice is reported along the west shore of Lake Michigan. Ice fields on the east shore are not extensive, and do not extend as far north as reported last week. The ice is decreasing at the straits. No ice is reported in Lake Huron from Middle island to the mouth, except small portions along shore. St. Clair river opened up during the week and the ice has run freely from Lake St. Clair, so that little ice is reported in the Detroit river. No ice is reported in sight in Lake Erie from Bar point. The reports indicate considerable ice around Put in Bay island but it is softening up rapidly. Ice fields are reported from Ashtabula eastward to Buffalo, but they are moving with the wind. On Lake Ontario the ice is confined to the extreme eastern portion. In comparison with last year for the same period there is more ice reported over eastern Superior, while in the St. Marys river the conditions are about the same. There is less ice reported in Lake Huron and over the western portion of Lake Erie. On Lake Ontario the ice is not reported as thick as last year.

DESTRUCTION OF THE MONTREAL.

The fire which destroyed the Richelieu & Ontario Navigation Co.'s steamer at Montreal last week was of unusual fierceness, owing to the fact that it was impossible, until the steamer was practically a mass of embers, to bring water to play upon it. Everything was frozen up. What started the fire is as yet unknown but it originated on the after part of the main deck. Hundreds of people had climbed upon the roof of the Allen Line shed to get a better view of the fire. Their weight caused the building to collapse and two persons were killed and about seventy-five injured. The Montreal was built by the Bertrams at Toronto at a cost of about $350,000 and had been towed to Montreal to be fitted out. She was to have gone into commission on the Montreal-Quebec route this summer. Her loss is therefore seriously felt by the company, though the vessel was fully insured.

A circular from the Lake Michigan & Lake Superior Transportation Co. of Chicago announces that Edward J. Kelly, in addition to his office of general freight agent, is appointed general passenger agent of the company, effective at once, vice C. F. A. Spencer, resigned.

Dennis J. Swenie's name is now borne by one of the fireboats of Chicago, formerly the Geyser, in accordance with the action taken by Mayor Harrison in honor of the late fire chief.

BRITISH CONSUL ON LAKE FREIGHT HANDLING.

The wonders accomplished in the mining and handling of iron ore in the United States by the application of modern machinery are outlined in a special report to the British government made by the acting British consul at Chicago, Mr. T. Erskine. The report is entitled "Report on the Iron Ore Industry of the United States," but gives especial attention to the modern methods of mining and handling ore, by which hand labor has been greatly reduced. While the subject is very familiar to lake men, it is reproduced in the Review for the interest which obtains in it. In mining ore in certain parts of the Lake Superior region, he says, the top covering of ground rock is scraped off over the whole property before mining begins. Railroad tracks are then laid direct to the ore bed, and the ore is loosened by blasting. Steam shovels are then brought into use and they load the ore directly upon the cars, one of these machines having loaded 170,000 tons in twenty-six days, or at the rate of over 6,500 tons per day. These loading machines, which daily handle more than 6,000 tons, are each operated by five men, and the labor cost for mining and loading averages but about 16 cents per ton, and in the case of one mine which dug and loaded 293,651 tons in 174 days, the labor cost was only 4 cents per ton.

In the transfer of ore from mine to vessel on the lakes the absence of hand labor is also noticeable. The ore trains are run onto long docks extending high above the water and having large pockets or apartments into which the ore is discharged from the cars through an opening in the bottom of the car, from which the ore runs by gravity into the pockets beneath the tracks. From these pockets the ore is loaded into the vessel, also by gravity, and passed down long chutes into the hold of the vessel so that no hand labor is required in transferring the ore from the cars to the vessel. The ore pockets or apartments, which form a part of the dock, hold about 160 tons each, and number from ninety to 384, according to the length of the dock.

In unloading the ore from the vessels the saving of labor, he says, through the use of machinery is even more notable and important in its economies and results.* A series of steel bridges, so adjusted as to be easily moved along the docks, is supplied with a hinged arm, which can be lowered to the hatch of the vessel. Along this arm and across the bridge runs a trolley train to which are attached automatic "grabs" similar to a double scoop, which are so constructed that the grab or scoop digs downward into the ore as it closes. The grab or scoop holds about 5 tons of ore and is described as a "digging machine," as when it begins to draw together it digs into the ore and does not depend on its weight to get hold of the ore. There are fifteen unloading machines in a battery, and the grabs run down the long arms which are lowered over each of the large number of hatches in the decks of lake vessels carrying ore. These hatches run nearly the whole way across the decks. The grabs can thus remove over half the cargo without any assistance and the remaining half is brought directly under the hatch by use of a scraper, also operated by similar machinery and managed by a man in the hold through the use of long cords. This scraper brings the ore from between the hatches so that it can be raised by the grab. These grabs are controlled by the engineer who can drop them at any point over the hold that he may wish and after it seizes its load of ore it is raised at full speed, carried rapidly along the trolley to such given point as desirable, where the ore is deposited into railroad trucks or stock piles, or in some cases at furnace plants into concrete troughs, through which it slides to the furnaces where it is to be transferred into pig iron. This grab, which thus lifts 5 tons of ore from the vessel, carrying it to such point as is desired within a limited space, has a hoisting speed of 100 ft. a minute, and can run along the bridge at the rate of 1,000 ft. a minute. The operator travels with the grab and can unload it at any given point desired. The bridges to which these arms with their grabs are attached can be swung in any direction, so that ore, limestone, or coke can be deposited or picked up anywhere in the yard, and are worked by electricity. Twenty-six men will now perform, under this system, the work for which 300 were required under the old system.

*This is true as contrasted with former methods of unloading but it is not true as contrasted with methods of loading. Nothing more economical than the present loading could be imagined.

DETROIT RIVER BRIDGE.

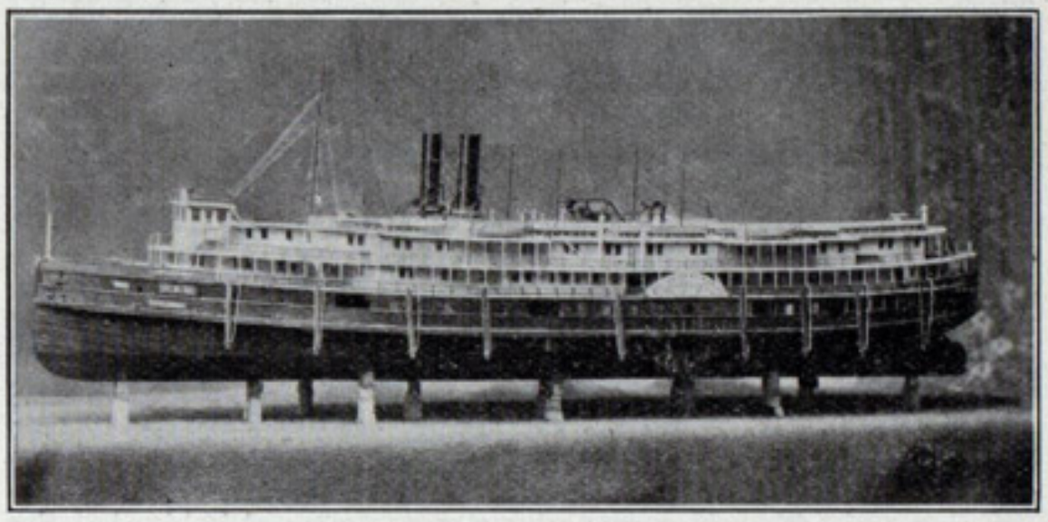
President William Livingstone of the Lake Carriers' Association recently gave out the following as his views on the Detroit bridge question:

"I am in favor of a railroad bridge for Detroit provided it is built so that it will be no obstruction to navigation. I believe that it would be a benefit to the city, that a majority of the people want it, and anything that will increase the growth and prosperity of Detroit I am for. And in this present age of engineering there is no reason in the world why a bridge should not be built that would be entirely satisfactory to both the vessel and railroad interests combined. I would say that about 125 to 135 ft. would be a sufficient height for a bridge. Spars are not nearly as high as they used to be and not used at all for canvas by steamers as formerly. As to the location of the bridge I have nothing to say, simply because it is a question for the different railroad interests to thresh out among themselves. As a matter of fact my opinion has been for some time that the real reason why the bridge has not been started sooner has been the inability of the railroads to agree among themselves as to where the bridge should be located rather than opposition from any other source."

Undoubtedly the lack of adequate railway facilities at Detroit is a serious handicap both to the railways and to the city. This is shown by the falling off in the number of passengers and the volume of freight handled during the winter time. Both producer and consumer are equally interested in this question. When it is remembered that about 14 miles of railway trains are ferried across the river every day in the year the total loss of time becomes staggering. In the winter time when ice fills the ferry slips a general embargo in traffic occurs. The blockade of last January was felt from Chicago to Niagara Falls and it was weeks before the railways had the congested freight moving again. There is not likely to be serious opposition to the bridge project by the vessel interests so long as the paramount right of navigation is safeguarded. Of course navigation has the right of way but if both can be handled without one inconveniencing the other there is no reason why the bridge should not be built. Mr. Livingstone is right in saying that the main cause of delay of late rests with the railways.

MODEL OF THE CITY OF DETROIT.

Mr. R. J. Barrow, of No. 102 Woodbridge street, Cleveland, has, with a great deal of patience, constructed a model of the City of Detroit of the Detroit & Cleveland Navigation Co.'s fleet. It is 37⅛ in. long and is constructed to a scale of ⅛ in. to the foot. The model was constructed from the same drawings as the original steamer. These drawings are ¼ in. to the foot, so that they had to be reduced one-half. Mr. Barrow worked upon the model for two years at odd intervals. The hull is constructed of wood and paper, cardboard being used for the cabins.



Model of the City of Detroit.

The funnels are of tin, the walking beam of brass and the railings of fine wire. The walking beam is fully connected with rods and journals and Mr. Barrow utilized the works of an old eight-day clock for motive power. When wound up the walking beam will run for forty-five minutes. Mr. Barrow has never learned any trade. He was during his young days a sailor on the lakes in his father's vessels. He left the lakes about twenty years ago and is at present a patrolman on the Cleveland police force. The accompanying illustration shows how faithfully the model has been constructed.

IMPORTANT CONTRACTS FOR HARBOR WORK.

Major J. G. Warren, United States engineer at Milwaukee, has been opening bids recently for several important harbor jobs on Lake Michigan. Probably the largest job is at Waukegan, Ill., which will exceed $300,000 in cost and involves the building of crib piers, crib breakwater, pile revetment, removal of the old pier and dredging. The Lydon & Drews Co. of Chicago was the lowest bidder for the pile revetment and dredging part of this work and the Housler & Lutz Towing & Dock Co. of Chicago lowest for the pier extension and breakwater work. Other bidders were the Fritz, Simons & Connell Co. of Chicago, Bennett & Schnorbach, of Muskegon, Adolph Green of Green Bay, and the Lake Superior Contracting & Dredging Co. of Duluth.

Nelson J. Gaylord, of Green Bay, was the lowest bidder on the work of building and sinking crib piers at Sheboygan, a contract involving an expenditure of something more than $80,000, and Adolph Green of Green Bay will very probably be awarded the job of building a small crib breakwater at Manitowoc at a cost of about $40,000. The Housler & Lutz company and the Lydon & Drews company also submitted proposals on these two jobs.

The Duluth Dredge & Dock Co. will be awarded the contract for 1,500,000 cu. yds. of dredging and for the removal of 3,000 cu. yds. of rock at Sturgeon Bay. On the rock work their bid was $16,500, while they offered to do the dredging at $148,500, working sixteen hours a day or at $157,500 on regular time. Other bidders for the work were the Lake Superior Contracting & Dredging Co. of Duluth, Samuel O. Dixon of Milwaukee, the Fitz Simmons & Connell Co., Housler & Lutz Towing & Dock Co. and the Lydon & Drews Co. of Chicago, G. H. Breyman & Bros. of Toledo, and Rogers & O'Brien of Buffalo.

Other proposals related to the furnishing of Oregon fir timber and plank for harbor improvements. The lowest bidder in

this case was the H. B. Waite Lumber Co. of Minneapolis, and its prices were as follows: For 6,339,792 ft. Oregon fir timber, per M ft. B. M., $8.70; 418,227 ft. Oregon fir timber, per M ft. B. M., $8.20; surfacing timber, one side, per M ft. B. M., $1; surfacing timber, two sides, per M ft. B. M., $1.50; surfacing plank, one side, per M ft. B. M., 90 cents; surfacing plank, two sides, per M ft. B. M., $1.40. Other bidders in this case were John K. Joice and Frank B. Stone of Chicago, the Eastern & Western Lumber Co. of Portland, Ore., Lewis & Crane of Seattle, Wash., the Menz-Hill Lumber Co. of Minneapolis, the South American Lumber Co. of Milwaukee, and the Chicago Lumber & Coal Co. of St. Louis.

CANADIAN MARITIME NOTES.

The Canadian Pacific proposes to operate the Elder-Dempster and Beaver Line steamers, recently acquired, as an integral feature of the Canadian Pacific system. It will therefore be in a position to quote through rates for freight and passengers from London, Liverpool and Bristol, Eng., to Japanese and Chinese ports on its own steamers and railway, and to Australian and New Zealand ports on the steamers of an allied company from Vancouver. D. W. Campbell, who has been manager of the Elder-Dempster Line at Montreal for several years past, has been appointed superintendent of the Canadian Pacific trans-atlantic steamers.

The new system at Father Point, Quebec, has been completed and is pronounced satisfactory to the department of marine. This point will probably be made the port of call for mails and passengers for the summer steamship service to Montreal, instead of Rimonski. Father Point is three miles from Rimonski, but is more accessible and a depth of 32 ft. of water can be produced without dredging. A wharf, wide enough to permit a double track of rails to be laid, will be completed in June.

It is reported that the Grand Trunk Railway is negotiating with H. & A. Allan respecting the purchase of a number of their steamers, but not much credence is given to the story. It is quite likely, however, that the Grand Trunk, now that the Canadian Pacific has bought the Elder-Demster Line, will make closer relations with the Allan's or other steamship companies than hitherto. At present the railway has agreements for a winter service at any rate with the Dominion and the Allan Line steamers sailing from Portland, Me.

Fears are beginning to be entertained by shipping men that the dominion government steamers Stanley and Minto, which maintained the winter service between Prince Edward island and the mainland, and which have been fast in the ice for some weeks, will be considerably damaged, if not totally lost. The Stanley has been fast since early in January, and the Minto has only made one trip since early in February.

A. P. Cockburn, manager of the Muskoka & Georgian Bay Navigation Co., retires from that position March 31, and will be succeeded as manager by C. H. Nicholson. Mr. Cockburn went into the Muskoka country in 1865, and in the following year built the first steamer on the Muskoka lakes. Since then the business on the lakes has grown to great proportions, owing to its increasing popularity as a tourist resort.

The Montreal Transportation Co. has sold another of its steamers—the Glengarry. The Glengarry was built at St. Catherines in 1876, and lengthened in 1886 at Kingston. The company is in the market for a powerful steam tug for its barge fleet, but it has not yet been decided whether the new boat will be built in Canada or in England.

The steamers Hektos and Hesperus of 3,000 tons register each have been acquired for the new Franco-Canadian Steamship Line between La Rochelle, France, and Quebec and Montreal. The service will be a monthly one, the first steamer sailing from La Rochelle on April 15.

The side-wheel steamer Montreal, built for the Richelieu & Ontario Navigation Co. by The Bertram Co. at Toronto last year, and towed to Montreal to be completed, was burned to the water edge at that port Saturday. The steamer cost $350,000 and had not been in service. The vessel is fully insured.

G. H. Keating, Toronto, P. W. St. George, and M. Perrawlt, Montreal, and W. J. Sproul, acting chief engineer of the Montreal harbor commission, have been appointed by the minister of marine to investigate and report on the question of the construction of a dry dock at Montreal.

The Lake Manitoba Quarry & Transportation Co. has been incorporated at Winnipeg to carry on a general navigation business on Lake Manitoba. C. W. Maloon, the Narrows of Lake Manitoba, and R. M. Harrison, banker, Carberry, Man., are among the promotors.

The new service between St. John, N. B., and Yarmouth, N. S., is to be inaugurated by the steamer Messenger. Two trips a week will be made each way.

At Shelburne, N. S., there has just been launched a 110-ton schooner, the Percy Roy, and there is on the stocks nearly ready for launching a 75-ton schooner.

The St. John, N. B., city council has decided to invite tenders for a side-wheel ferry boat for the harbor.

Negotiations are pending with J. Millard of Liverpool, N. S., for the construction of a steamer for the North Sidney pilotage service.

The steamer A. J. Lymon of Toronto has been sold to Geo. Gooderham, who had a mortgage for $4,500.

GREAT BRITAIN'S IRON ORE SUPPLY.

Doubtless every one who is interested in iron and steel is interested in the iron ore deposits of the world. When one appreciates the scramble of the old countries for iron ore supplies, and the lengths to which they have to go to make them available for consumption one appreciates more thoroughly the blessings which entail to this country through the enormous deposits of the Lake Superior region, which have the triple advantages of abundance, quality and cheapness of transportation. In reviewing the situation as respects Great Britain's supplies of iron ore during 1902 the Iron and Coal Trades Review of London points out that "the twelve months have not done a great deal to increase the stability and hopefulness of British supplies of foreign iron ores. At the same time, our position from this point of view is probably more reassuring than it was a year ago. At any rate we have the fact that our imports of iron ore in 1902 have materially exceeded those of 1901 to confirm this view of the situation. Our total receipts of foreign ores in 1902 were 6,440,000 tons, or 892,000 tons in excess of the imports of the previous year. This corresponds roughly to an increased pig-iron output of half a million tons. Of this increase of ore imports more than one-half, or 425,000 tons, has been received from Spain, while the remainder has been supplied by other countries, including our own colonies and India, the latter furnishing manganese ores only.

"The increase of ore imports from Spain is mainly due to the opening up of supplies in other parts of that country than Bilbao. These other parts mainly embrace the regions that are tributary to the ports of Almeria, Carthagena Aguilas and Santander. From Bilbao district our iron ore imports in 1901 were 1,685,000 tons under those of 1899. This lost ground can only have been recovered, if at all, to a very small extent in 1902. The increase of that year is more marked from Almeria and Santander than from Bilbao, and these ports, with one or two others in the south of Spain, are likely to be the chief ports of export in the future. This, however, does not necessarily mean that the British iron industry must suffer thereby. Santander is practically as near as Bilbao to British markets. Almeria, Aguilas and Carthagena are a good deal farther afield, but freights do not run much higher than those of the Biscayan ports. Other fields in Spain are at this moment awaiting developments. One of the most important of these is that of Leon, where there are immense deposits of ore, assaying 38 to 45 per cent. of iron, that are now being exploited by a number of Spanish capitalists, of whom Mr. Julio de Lazurtigui, a well-known member of the Iron and Steel Institute, is the most prominent. Spain, moreover, still retains, as a perfectly virgin field, the vast deposits of the Calasparra mountains, which are only about seventy-five miles from the port of Carthagena, and which are now awaiting suitable railway facilities. These cannot be much longer delayed.

So far as the available supplies of Swedish ore are concerned, the Germans have secured the bulk of the shipments abroad, having in 1902 received 768,344 tons from Gellivara and 556,714 tons from Grangesburg. Indeed, the Germans took 75 per cent of the former ores and practically the wnole of the latter in that year. The opening of the railway from the mines of Swedish Lapland to the port of Ofoten, on the Atlantic, will give increased facilities for the shipment of these ores, and will guarantee open navigation all the year round. This, of course, is likely to lead to a considerable development of the iron ore trade, which, with the new deposits found in the past year in the same region, may largely increase in the near future.

"No new field of ore at the command of the British iron industry has, however, inspired greater hopes and fears than that of the Dunderland river, in Norway, now being opened up by a limited company, of which Sir David Dale is the chairman. Opinions differ materially as to the value of this deposit. The promoters and directors of the enterprise naturally think well of it, and are sanguine as to its future. On the other hand, there are authorities who hold quite a different opinion. Among the latter are Sir Thomas Morel, of Cardiff, himself largely interested in Spanish iron ore supplies, who, in a recent communication to the press, says that he does not 'think much of the Edison system of treating this ore, because the ore has to be ground to powder. The cost of the grinding, with the application of the process, would probably amount to about 4s. per ton. The ore could not be used in the form of powder and would have to be converted into briquettes, and the cost of that would probably be about 1s. 6d. per ton. Then, freight expenses from Norway to England would be about 4s. Thus about 9s. 6d. per ton would be entailed, without considering the mining and transport to the port of shipment. The expense will thus be rendered prohibitive.'"

The success which has attended the operations of the Lake Carriers' Association on the great lakes has aroused the interest of the vessel owners engaged in the coastwise and oversea service and a movement has been started to organize an association upon similar lines. It is represented that not until a compact organization exists on the coast, similar to the working arrangement on the lakes, can attention be secured from congress to the pressing needs of legislation for the improvement of ocean carriage.

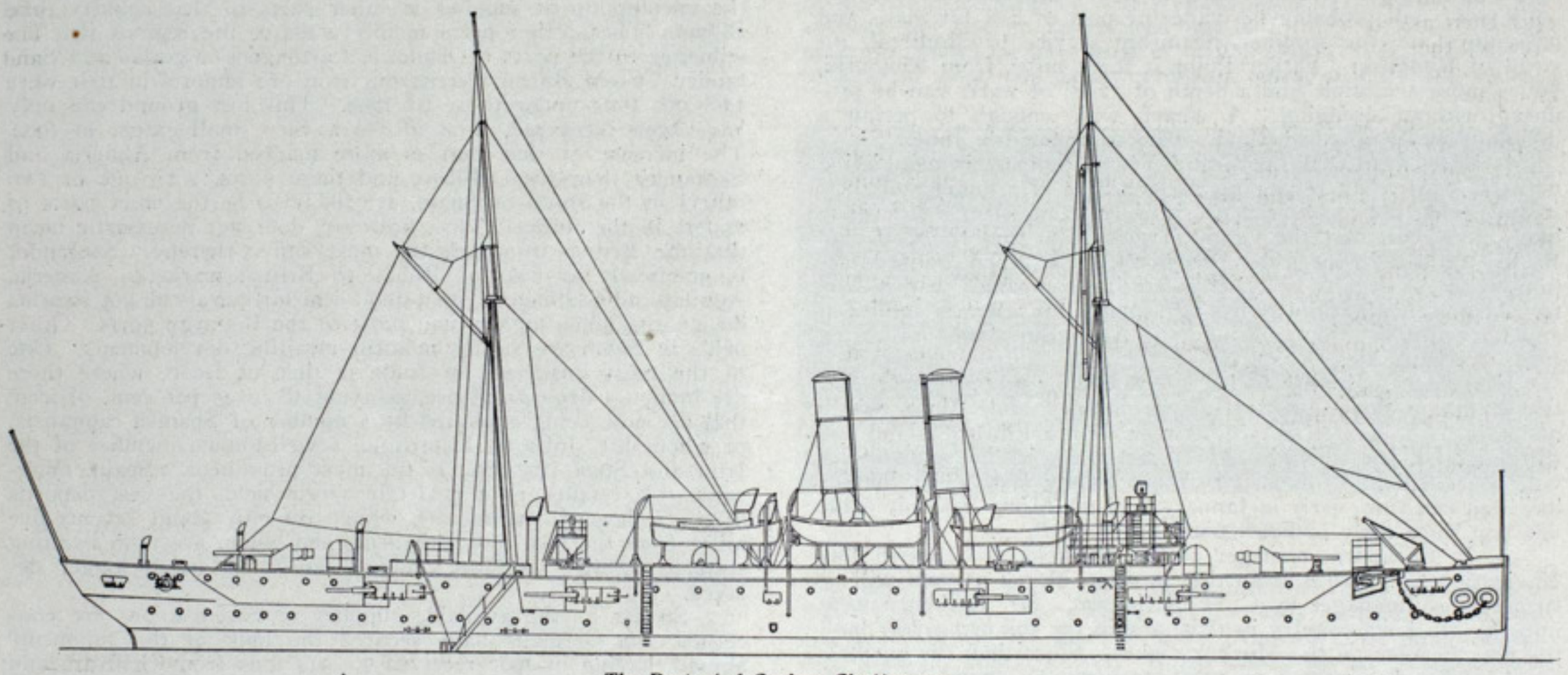
LAUNCH OF THE CHATTANOOGA.

New York, March 11.—The presence of a distinguished delegation from Tennessee added interest to the launch of the twin-screw protected cruiser Chattanooga at the Crescent Ship Yard, Elizabethport, N. J., on Saturday last. Arrangements for the launching were perfect, not a hitch or incident occurring to mar the festivities of the occasion. The steamer Nassau, which was under special charter, carried the Tennessee delegation and other invited guests from New York to the ship yard and return, leaving her dock at pier A, Battery Park, at noon and arriving back at 5 p. m., with everybody aboard expressing their pleasure over the delightful afternoon they had spent as guests of the United States Ship Building Co. That the affair passed off so pleasantly and satisfactorily was owing largely to the efforts of Mr. Lewis Nixon, who personally looked after the comfort and welfare of the guests, ably assisted by other officials of the company, including Messrs. A. C. Gary, treasurer; Cyrus C. Wells, secretary, and Richard Deming, agent. The route to the ship yard lay through the inner New York bay, the Kill von Kull, Newark bay, and into Arthur Kill, which connects Newark bay with the Atlantic and on the banks of which the Crescent Ship Yard is located.

Arrived at the ship yard the company was escorted to a carpeted platform built about the bow of the cruiser, immediately in front of which and in the center of the platform was a raised stand where little Miss Lillian Nelson Chambliss, the beautiful, sweet-faced, twelve-year-old daughter of Mayor Alexander W. Chambliss of Chattanooga, deigned as queen, attended by Miss Reita Faxon and Miss Frances Lippitt Bond, maids of honor, Master Carter Lupton, acting as page, Governor J. B. Frazer and Mrs. Frazer, Mayor and Mrs. Chambliss, United States Senator Carmack and Mrs. Carmack, United States Senator Bate and other brave sons and fair daughters of Tennessee. As the christening party mounted the platform Mrs. Lewis Nixon presented Miss Chambliss and her maids of honor with beautiful boquets of American beauty roses and lilies of the valley, and during the short wait while the moorings that held the vessel to the ways were being loosed Miss Faxon, one of the maids of honor, sang "Dixie" and "Suwanee River," receiving hearty applause therefor. It was a happy party that crowded the platform, each face beaming with pleasurable expectancy, awaiting the final act of christening, with one notable exception, that of Mr. Nixon, whose face wore an anxious expression, the cause of which was explained in his remarks on the homeward trip.

Then the signal was given, the last stay that held the cruiser fast was severed and with a slight tremor she started down the ways, while at the same moment Miss Chambliss, exclaiming "I christen thee Chattanooga," broke the gold meshed bottle of champagne over her bow. As the throng of spectators realized that the ship had been christened and that she was off, a great cheer arose which lasted until after the vessel had struck the water and was turned broadside on by the tide. Everybody pronounced it an ideal launching and a beautiful sight, the memory of which would ever recall pleasurable emotions. At the close of the christening exercises the company repaired to the offices of the ship building company and partook of a regal lunch, which finished, they boarded the Nassau for the homeward trip.

That everybody was happy, the Tennesseeans in particular, was soon made manifest, as vocal strains of "Dixie," "Suwanee River," "Old Kentucky Home" and other songs dear to the southern heart filled the air. The songs finished, speeches were called for and Mr. Nixon, responding to repeated calls, stepped forward, his face beaming with a glad smile that had replaced the look of anxiety of an hour or so before, which transition he explained by saying he had had a burden lifted from his mind, for with the ship builder, no matter how many vessels he might build, each and every launching was a matter of deep anxiety, and to see the vessel glide down her ways and take the water without mishap took the lump out of the ship builder's throat and enabled him to feel cheerful once more. He then in his happy style introduced Governor Frazer of Tennessee, who said in part that he felt this was a proud day for Tennessee and that he was proud of belonging to that state, the sons of which had never been found wanting when duty called. A Tennesseean had led sons of the southland in the war of the revolution, Andrew Jackson had led Tennesseeans to victory in the war of 1812, and James K. Polk had performed a like duty in the Mexican war, while in the great struggle of the sixties between the north and south Tennessee had furnished even more than her share of men, according to population, the number being 115,000 to the confederate army and 30,000 to that of the union. When war was declared with Spain patriotism was ablaze over the south and they stood ready to vie with the north in the defense and upholding of "old glory." That while the north had sent a Dewey to win fame in Manila bay, the south had furnished a Schley to win laurels at Santiago. While the north had furnished a Roosevelt to lead his rough riders up San Juan hill there also was seen General Joe Wheeler of the South climbing up into a tree the better to observe the movements of the enemy. Thus united as we stand today we are the greatest nation on the earth, greatest in natural resources and greatest in brains whereby to make the best use of such resources. This being the case we should have the greatest navy in the world, not necessarily for war but rather to maintain peace, and while expressing the hope that the cruiser which had just been christened after the beautiful Tennessee city might never be called upon to shed human blood, he felt that should such time come she would, like the people of the city for which she was named, not be found wanting. He closed by thanking all, in the name of Tennessee, for the cordial greeting the delegation from the state had been accorded.



The Protected Cruiser Chattanooga.

Mr. Nixon, who acted as chairman of the impromptu meeting, then introduced Mayor Chambliss of Chattanooga, who said that although he esteemed it a favor and an honor to have the opportunity of addressing the gathering and thanking Mr. Nixon and the many kind friends who had aided in making the dav the happiest of his life, the supreme moment being when he beheld the hand that had often clasped his neck grasp the neck of the champagne bottle and christen the cruiser, still he lamented the fact that he was called upon to follow Governor Frazer, who was Tennessee's bird of oratory, and that he was not a bird and could not hope to imitate one as the fellow did who came home in the "wee sma hours ayent the twal," and when his wife called to him from up stairs to tell her the time, answered "eleven (hic) o'clock m'dear." Just then the cookoo clock in the hall sang out the hour of four and the poor wretch had to cookoo, cookoo seven times more in order to make his eleven good. As he was not that kind of a bird he could not hope to imitate the governor, but he could say that he was proud of the honor of being mayor of Chattanooga, and never so much so as when he beheld the beautiful cruiser named in honor of his city and witnessed the christening ceremonies. He would go home with even more pride for Chattanooga and all the name implied and would take with him the kindliest remembrances of the occasion and of the many kind friends who had made his visit one of so much pleasure. In the name of his beloved city he returned thanks to each and every one.

United States Senator Bate, who was also called upon, arose with the remark: "I know you don't expect a speech from me. However, as I am from Tennessee and love the state and Chattanooga, although I do not live in that beautiful city, I wish to say that I had the honor of choosing the name of the cruiser we have just christened; that from all the names in the state I chose

the one she bears, and I challenge the world to produce a more fitting or beautiful one. The name is historical and inspiring to patriotism. I was on the site of the beautiful city of Chattanooga when it was but a mere hamlet nestling at the foot of Lookout Mountain when two great armies tramped about it and contended for its possession. I was in one of those armies when the great battles of Lookout mountain and Chickamauga were fought and history was made. I have seen the hamlet of Chattanooga since that time grow into the beautiful city of today and it is still growing, and Lookout mountain now casts its shadow over a busy, thriving city instead of the hamlet of the sixties. The palace has taken the place of the hovel and the factory that of the shed-roofed shop. Hence we are proud of Chattanooga and pleased with the thought that the cruiser named in the city's honor will bear her name throughout the world. I thank you."

Ex-Secretary of the Treasury Lyman J. Gage was then called on for a speech. He began by chiding Mr. Nixon for calling on him to speak, as he should know that he was not equal to the occasion when he had to follow after southern eloquence, which sprang spontaneous from the sons of the land of flowery speech. However, he was proud of his citizenship and rejoiced that north and south of our beloved country were one on land and sea, the only rivalry between the sections being to see which could do the most for their country.

By this time the Nassau had reached her dock at Battery Park and the happy throng that had filled her to her full carrying capacity, after expressing themselves as having enjoyed the most pleasant outing of their lives and voting Mr. and Mrs. Nixon, with their assistants, all that could be desired in host and hostess, departed their several ways, to carry with them pleasant memories of a joyous festal occasion and longing for another treat of like character.

In the Tennessee party were Governor J. B. Frazer and Mrs. Frazer; Mayor A. W. Chambliss of Chattanooga and Mrs. Chambliss; Miss Lillian Nelson Chambliss, Miss Reita Faxon, Miss Frances Lippitt Bond and Master Carter Lupton; United States Senators Bate and Carmack and Mrs. Carmack;; Gen. H. V. Boynton of the Chattanooga-Chickamauga Park Commission; Major Knight, in charge of Tennessee river improvements; Congressman John Moon, Mrs. Henry Bond and Miss Mary Bond, T. J. Lupton, Mrs. Lupton and Miss Temple of Knoxville, Tenn.; Charles A. Lyerly, president of the city council; T. J. Gillespie, city treasurer; Alderman C. B. Russell, C. R. Lich and Victor De Georges. The navy was represented by Comdr. Charles A. Adams, Captains P. F. Harrington and J. A. B. Smith, Lieut. Comdrs. William P. White and Burgdorff, Lieut. Albert Moritz, Past Assistant Engineer Day and Naval Constructors W. L. Capps, J. J. Woodward, Stuart Farrar Smith and Williams, and the army by Colonels T. A. Baldwin and Alexander Gordon, and Capt. Hutchinson. In the list of those present the following were also noted: Lyman J. Gage, ex-secretary of the treasury; the consuls general of Great Britain, Germany, France, Russia and Italy; the Japanese ambassador and wife; Alexander A. G. Bontoakow of the Russian navy; Comdr. Arthur P. Nazos; Lieut. G. Faramond, naval attache of the French legation; Prof. C. H. Peabody of the Massachusetts Institute of Technology; Capt. Manuel Azueta and staff of the Mexican navy; Senators John F. Dryden, John Kean and Representative Charles N. Fowler of New Jersey, and Mayor P. J. Ryan of Elizabeth; Congressman Charles N. Fowler; President Hanscom and S. M. Swift of the Eastern Ship Building Co., New London, Conn.; Lewis Nixon, president of the United States Ship Building Co., and Mrs. Nixon; Hichard Deming of the United State Ship Building Co. and Mrs. Deming, and daughter; A. C. Gary, treasurer, and Cyrus C. Wells, secretary of the United States Ship Building Co.; Henry R. Curwen and N. C. Cushing of United States Ship Building Co. and Mrs. Deming, and daughter; New York Ship Building Co. Among guests from New York were Justices Morgan J. O'Brien and Henry Bischoff, and Mrs. Bischoff; Congressmen Bristow, Lessler, Sulzer, Goldfogle and Stoner; Bridge Commissioner Lindenthal, County Clerk Hamilton; Fire Commissioner Sturgis; Otto Kempner, John D. Crimmins and Miss Crimmins, Miss Collamore, Miss Fayette Ruiz, Charles B. Alexander, F. L. Du Bosq, Franklin C. Hoyt, A. Crawford Chenowich, C. R. Moore and Mrs. Moore, Charles S. Bryan and Mrs. Bryan, De Frees Critten, Mrs. Critten and the Misses Critten; A. Cary Smith, the yacht designer; Patrick Calhoun, Arthur Logan, W. W. Nixon, W. N. King, Frank Robinson, Mrs. Frank Robinson and Miss Elsie Robinson, and Frank Croker.

The principal dimensions of the Chattanooga, a twin-screw protected cruiser, are: Length over all, 308 ft. 6 in.; length on load water line, 292 ft.; breadth, extreme, 44 ft.; draught, 15 ft. 9 in.; displacement in tons, 3,200. The Chattanooga is built throughout of steel to the highest government requirements. Below the load-draught line her hull plating is sheathed with Georgia pine, having a bar keel of East Indian teakwood, secured to the ordinary skin plating of the vessel by means of composition bolts and nuts. A cillular bottom extends the full length of the vessel and is subdivided into twenty-eight watertight compartments. The Chattanooga has ten complete transverse watertight bulkheads extending well above the waterline, and has four steel decks, the main deck being covered with Georgia pine 3½ in. thick, the remainder being covered with extra-thick linoleum. The protective deck is of nickel steel 2 in. in thickness and slopes at an angle of 15° to 3 ft. below the load line, the full length of the ship. A deep cofferdam is built inside the ship in the region of the waterline, and is filled with corn-pith cellulose for protective purposes. Fireproof wood has been generally used wherever enamelled sheet iron was impossible, so as to minimize as much as possible all danger arising from fire.

The watertight doors throughout the ship are operated on the well-known Long-Arm system and can be worked from a central station or separately as may be desired. To prevent the compasses from being disarranged, the pilot and chart house has been built of Tobin bronze.

The armament of the Chattanooga consists of ten 5-in. quick-firing guns in the main battery, one each being located at the ends of the vessel on the main deck and four on each broadside of the gun deck. The secondary battery consists of eight 6-pounder rapid-firing guns, and two 1-pounders, with four machine guns and one field gun for landing purposes. It is interesting to note that in lieu of the heavy casemate armor for guns usually adapted for screening the gunners in large ships of war, the gun ports of the Chattanooga are protected by side plating of nickel steel 1¼ in. in thickness, thus affording a maximum protection against an enemy's gun fire, with a minimum of weight. Electrical hoists are installed for providing the various guns rapidly with ammunition from the magazines, and in case of mishap hand gear is also arranged to work the ammunition hoists. Two powerful search lights are installed on the flying bridge and four large dynamos generate the power necessary for lighting and other purposes.

An efficient system of draining and flooding the many compartments of the vessel is arranged for, as is also a powerful fire main to rapidly cope with fire in any part of the vessel. The heating and ventilation arrangements, upon which the health and comfort of the ship's complement so much depends, is of a very elaborate nature, numerous fans being provided for supplying and exhausting air quickly. The necessary apparatus for distilling water is also arranged for, and the refrigerating plant and cold storage chambers are specially designed to meet the requirements of a large crew. The Chattanooga is fitted with Williamson's steam steering gear and has also a powerful steam windlass and capstan made by the Hyde Windlass Co., of Bath, Me. In addition two electrical deck winches are fitted on the main deck for handling efficiently the ten boats with which the vessel is equipped. The vessel has two steel masts and is to be fitted with a wireless telegraphing equipment. For catting the anchors two collapsible cranes are installed.

The engines are of the vertical inverted-cylinder direct-acting triple-expansion type, the cylinders being 18, 29 and 35 in. diameter, with a stroke of 30 in., and are expected to develop 4,500 I. H. P., with a speed of 16½ knots. The boilers are six in number of the Babcock & Wilcox type, fitted with forced draft and to work at a pressure of 275 lbs., with a grate surface of 300 sq. ft. and total heating surface of 13,000 sq. ft. The bunker capacity is 700 tons of coal, which at a speed of 10 knots gives a cruising radius of over 5,000 knots.

APPOINTMENTS OF MASTERS AND ENGINEERS.

Boynton, L. R., Mgr., Island Trans. Co., St. Ignace, Mich.: Steamers—Aglomah, Capt. G. W. Boynton, Engineer R. A. McLaughlin; Wau-Kon, Capt. A. R. Graves, Engineer G. Densmore.

Boynton, L. R., Mgr., Mackinac Trans. Co., St. Ignace, Mich.: Steamers—St. Ignace, Capt. H. A. Boynton, Engineer Jos. Rosseau; Sainte Marie, Capt. L. R. Boynton, Engineer R. Walsh.

Mehl, Edward, Erie, Pa.: Steamer—Uganda, Capt. W. W. Wilkins, Engineer Wm. M. Phillipie.

Minneapolis, St. Paul & Buffalo S. S. Co., Buffalo: Steamers—Minneapolis, Capt. G. W. Moore, Engineer D. J. McMillan; Huron, Capt. W. Moore, Engineer Clinton C. Folkerts; St. Paul, Capt. Peter Thompson, Engineer Henry Stone; Wm. Castle Rhodes, Capt. P. Dowdell, Engineer Guy Hemenger.

Nessen & Co., J. O., Manistee, Mich.: Steamers—F. W. Fletcher, Capt. H. Bennett, Engineer Geo. Hopkins, Chas. Rietz, Capt. Chris Edwardson, Engineer Ed. Owens; H. L. Worthington, Capt. Peter Young, Engineer Geo. Patterson.

Northwest Transportation Co., Sarnia, Ont.: Steamers—Huronic, Capt. Robt. D. Foote, Engineer Samuel Brisbin; Monarch, Capt. Edward Robertson, Engineer Thos. O. Bard; United Empire, Capt, John McNab, Engineer Frank Cleland; Majestic, Capt. Andrew Campbell, Jas. W. Ashton.

Robertson, Geo., Grand Haven, Mich.: Steamer—S. O. Neff, Capt. Geo. Robertson, Engineer Frank Greilick.

Rice, W. E., Harbor Beach, Mich.: Steamer—Rhoda Stewart, Capt. Wm. J. Cowles, Engineer G. McLelland.

Stewart Transportation Co., Detroit.: Steamer—A. E. Stewart, Capt. Stewart, Engineer Robert Lacey.

Crosthwaite, J. L., Buffalo: Steamer—St. Louis, Capt. James Brines, Engineer J. A. Dillon. Schooners—Champion, Capt. G. Hansen; Buckeye State, Capt. John Mills; Ben Harrison, Capt. R. C. Smith.

Wilson Transit Co., Cleveland: Steamers—Henry W. Oliver, Capt. W. W. Dawley, engineer Frank C. Stoeber; Captain Thos. Wilson, Capt. J. S. Wood, Engineer Fred Harmon; Andrew Carnegie, Capt. C. C. Tousley, Engineer James F. Derrig; W. D. Rees, Capt. Chas. A. Benham, Engineer H. A. Lindsley; Yuma, Capt. Daniel Buie, Engineer John Heinkelmann; Spokane, Capt. James Higgins, Engineer Charles Stoeber. Schooner—David Z. Norton, Capt. James D. McPherson.

RETROSPECT OF SHIPPING.

A Comprehensive Review of the Year 1902 by the Shipping World of London—Marine Engineering, Wireless Telegraphy, Liquid Fuel and Subsidies.

The Shipping World Year Book for 1903 is out. It is a port directory of the world, including the tariffs of all nations, published by the Shipping World of London. The additions to the volume are the new tariffs of Australia, China, Newfoundland, the Transvaal, the Philippines, Venezuela and other countries; the new admiralty regulations for the training of naval officers; the naval expenditure and merchant navies of nations; a list of customs boarding stations; new board of trade rules; customs regulations governing the importation of sugar and articles of cognate description, and many other things of interest.

A new feature has also been incorporated, being a retrospective view of the year 1902, and it is with this that we will deal at length, for it possesses many facts of interest. Moreover Major Jones, the editor, has views of his own which add zest to his narrative. Concerning the position of ship building nations he says:

"The clouds of coming depression have been casting their shadows upon the commerce and industries of the world for nearly two years. The realities of bad times, overdue, were staved off by the adventitious demand for, and high prices of, labor, materials, freights and shipping, produced by the war in South Africa. With the return of peace and the cessation of abnormal demands, the ranks of labor, and the volume of merchant tonnage available to carry on the oversea commerce increased, whilst the world's profitable shipping business fell rapidly away. The prosperity enjoyed by German industries, created largely by artificial means in the Reichstag and financial circles, after waning for two years, has been submerged by a wave of adversity almost without parallel in the Fatherland. Indeed this adversity has been general and severe throughout Europe. We of these British Isles have felt it least of all in the old world; but we are feeling it now. For about six months of the year prices and wages were maintained at a high level, while ocean freights were low, and orders for new tonnage could only be secured at prices which yielded no adequate, if any, margin of profit. The picture in the kaleidoscope is changing; there are thousands out of work; prices of steel, of plates, of copper, coal and timber are declining despite all efforts to keep them up. Fortunately, the leaders of trade unions are thoughtful, strong men. They know that the tide of trade may not forever flow—that it must fall with something of the regularity of the rise—and they may be counted upon to discourage and avoid conflict against the inevitable. Prices must sink further, while the world's needs go on increasing, creating demands at the lower prices and in an atmosphere of returning confidence. But let us not mistake the Indian summer, with its maple syrup, which is but the harbinger of slush and snow and hard frost, for the reason of long days of warmth, ripe fruit, and luxuriant crops leading to harvest.

"In shipping and ship building (which we shall deal with presently) Britian is an easy first. Even the German and French yards, with their cheaper labor, are unable to compete in price and expedition with those of England, Ireland and Scotland. Less favorable still is a comparison to the establishments of the United States, for, notwithstanding their substantial advantages in coal, steel, plates and labor-saving machinery, British yards can build first-class tonnage at prices from 30 to 40 per cent less than those on the Atlantic and Pacific coasts. The alleged reason given for this remarkable discrepancy is that the artisans and laborers engaged in the American ship building and engineering industries are better paid than their fellows in British yards. That American workers draw larger pay is admittedly true. Equally true is it that they work for longer hours. The interesting question for economists who are concerned with the facts is this: How does the purchasing power of an hour's work done on the Delaware compare with that of the Clyde? Perhaps the position of the British artisan in respect of the rewards, conditions and hours of work is the most favorable—the best—of any artisan anywhere. We are waiting for additional light to be shed upon this important question by the reports of the individual members of the Moseley commission.

THE WORLD'S PRODUCTION OF TONNAGE.

"The world's production of tonnage in 1902 reached 2,476 ships, aggregating 2,733,024 tons. To these totals British ship builders (including the colonies, with eighty-six ships of 24,700 tons) contributed 1,459 ships, making 1,669,354 tons, leaving only 1,017 ships of 1,063,670 tons, being 39 per cent of the total output, to be supplied by the other fifteen ship building countries of the world. It will be noticed that the foreign list is headed by the United States, whose output though slightly below the figures of 1901 is still well above the total of her nearest competitor, Germany. The greatest tonnage output by a single firm during the year was that of the American Ship Building Co. (combination on the great lakes), whose several yards sent afloat 132,197 tons of shipping. Then comes the ship yard of Messrs. Harland & Wolff of Belfast with 79,497 tons, a total which seems small. But a comparison of values would reverse the order of priority.

"It were out of place to enter into particulars in this survey. We may say, however, that 1902 was a year of 'records.' Messrs. Harland & Wolff launched the largest ship ever built in the Cedric, of 20,970 gross tons; the Kaiser Wilhelm II., of 20,100 tons and 40,000 I. H. P., to steam 24 knots an hour, and therefore to be the fastest merchant ship afloat, was launched by the Vulcan Co. of Stettin. The new Cunarders to be built, one by Vickers, Sons & Maxim and the other by Messrs. C. S. Swan & Hunter, Ltd., are designed to pass her; and Mr. J. C. Tecklenborg of Geestemunde got the largest full-rigged sailing ship, the Prussen, of 5,080 tons, afloat during the old year.

AN ANALYSIS OF BRITISH TONNAGE.

"An analysis of last year's British tonnage output reveals the fact that only 6.24 per cent of it was destined for warlike purposes; and of the total merchant tonnage launched 94.4 per cent was steam. In 1901 this ratio stood at 96.1 per cent and in 1900 at 97.8 per cent, so there is a tendency towards the building of sailing ships. For the three years given the sailing tonnage launched equalled 89,127 tons in 1902, 62,313 tons in 1901, and 34,558 tons in 1900. The tonnage launched from British yards for foreign buyers, which in 1900 amounted to 430,495 tons, or 26 per cent of the output, had fallen in 1901 to 364,379 tons, or 20.8 per cent, and fell still lower last year to 283,002, or 17.3 per cent of the ships launched. Against this decline may be set the fact that the British colonies ordered more British-built tonnage in 1902 than in any previous year. The totals were: 1902, 76,326 tons; 1901, 26,239 tons; 1900, 5,984 tons. Last year Austria headed the list of foreign customers with orders for 39,267 tons, Germany coming second with 35,891 tons, or less than half her total for 1900. Norway and Sweden bought new ships from British builders last year to the extent of 24,285 tons, and Greece 21,272 tons; no other country passing the 20,000 tons mark.

"Though the gain is small, it is interesting to note that the average size of the merchant ships (the vessels that remain after deducting warships, yachts, fishing craft, barges, etc.) launched from British yards last year reached 3,903 tons apiece, as against an average of 3,757 tons each for the same class of ships launched in the previous year. But the big ship is most notable in the case of Messrs. Harlands & Wolff, whose seven vessels averaged 13,250 tons. And not one of these vessels is meant to be a "flyer." All are intended to carry large cargoes at economical speeds. Roughly stated, a 24-knot Atlantic liner costs twice as much as a 20-knot vessel designed to make the same trip. Similarly, to gain 10 per cent in speed on a 21-knot boat a 23-knot boat of equal weight would require 55 per cent more power. Such is the cost of speed. But if we are content with reasonable speeds then the economy of the big ship is soon apparent. It needs only to be said that the cost of a 9,000-ton steamer for coal is less than half that of a 4,000-ton steamer per ton per mile. Thus we have gone on increasing the size of our ships without materially adding to their speed, until now we find our latest White Star leviathians carrying a ton of cargo over a distance of 220 miles for expenditure of one pennyworth of coal. As a corollary, the big ships imply larger docks and deeper channels, and the value of contracts now being executed in harbors, docks and piers is about £13,000,000.

ENGINEERING AND THE WORLD'S MERCANTILE MARINE.

"On the earth no startling innovations in engineering marked the progress of 1902 across the vista of time. And those who fain would soar into the heavens above the earth have still before them the task of designing a satisfactory (air ship.) Nor can it be said that unqualified success has crowned the efforts of those who would go down into the waters under the earth. Whether considered as a warlike weapon or a commerce carrier, the submarine gives but a halting promise in respect of the future. Certainly the most interesting feature of the marine engineering year was the further popularization of the steam turbine. The total power of turbine vessels completed, or nearly completed, including torpedo-boat destroyers, yachts and passenger steamers is now about 83,000 H. P., a figure which shows that the turbine is well beyond the experimental stage. Nor are the reasons for this far to seek. The turbine takes up but little space; it is light; it is not liable to break down, and it requires less skilled attention than the reciprocating engine. So complete has been the success of the Clyde turbine passenger steamers, King Edward and Queen Alexandra, that the builders, Messrs. Denny & Bros. of Dumbarton, Scotland, have now several vessels of the same type on hand intended for cross-channel service. If these vessels behave well in a rough sea, orders for even larger turbo-motored ships may soon be expected. The new motor has proved itself most suitable for fast continuous steaming in smooth water. That it will be a success commercially in slow vessels and in rough weather has yet to be proved. The first part of the problem will probably find its solution in the performances of Sir Christopher Furness's turbine yacht, the Emerald, designed for the comparatively slow speed of 16 knots, while valuable data as to the behavior of the turbine vessels in rough weather will be furnished by the new English channel steamers now in construction at Dumbarton. Mr. Parsons believes thoroughly in the turbine for ocean liners, and, what is perhaps of even greater importance, so do many of our leading ship and engine builders.

"The total power of the machinery constructed by marine engineering firms throughout the United Kingdom in 1902 was 1,314,502 I. H. P., or close upon 12 per cent less than in the previous year. But the total steam tonnage launched decreased by 9 per cent, so, therefore, the proportion of power per ton averaged

nearly the same, being almost exactly .75 I. H. P. per gross ton in merchant ships. Steam pressures of 200 lbs. and over were more frequently heard of last year than at any previous time, but the quadruple engine makes little progress, only about twenty ships having been engined with that type in 1902. The next notable feature in marine engineering is, as before stated, the extended use of the Parsons' steam turbine, five sets, aggregating 19,000 I. H. P., being supplied last year. These were fitted as follows: In the Velox of the British navy, 8,000; 4,000 in the Clyde passenger steamer Queen Alexandra; 3,500 in the yacht Lorina; 2,000 in the yacht Tarantula, built for the late Col. McCalmont, and 1,500 in the yacht Emerald, built for Sir Christopher Furness, M. P.

"As a result of the admiralty boiler committee's labors and recommendations, more extensive trials, under modified conditions, are to be given to such boilers as the Durr, the Niclausse, the Babcock & Wilcox, and the Yarrow. The committee recognized that the water-tube boiler possesses many excellent features, and for the purposes of further trials they recommend that certain of our new ships should be fitted with boiler installations composed in part of water-tube and in part of cylindrical boilers. The committee's report makes it clear that all water-tube boilers are not proving as unsatisfactory as the Belleville.

"There are no new developments to note in connection with marine engineering in other countries last year. As in the case of the British Isles the output shows a reduction, the total reading 717,717 I. H. P. for 1902, against 790,476 I. H. P. for 1901. This reduction of nearly 73,000 I. H. P., or 10 per cent, taken in conjunction with an increase of 18 per cent in the foreign tonnage launched last year, would imply a lowering of the engine power fitted into the ships. To last year's total, German engine builders contributed 234,096 I. H. P., or nearly one-third; those of the United States, 174,024 I. H. P.; those of France, 80,590 I. H. P.; and those of Japan, 64,120 I. H. P.; no other country producing more than 36,000 I. H. P. in marine engines during 1902. To the German engine builders belongs the credit of constructing the highest-powered set of propelling machinery ever constructed for any one ship, namely the twin-screw engines for the Kaiser Wilhelm II. The vessel and her engines were built by the Vulcan Co., Stettin, for the Atlantic express service of the North German Lloyd. These engines are a distinct departure from the ordinary practice, in that they are divided into four sets, each of the four-cylinder quadruple expansion type. Each set is to be capable of indicating upwards of 10,000 I. H. P. and will be placed in a separate water-tight engine room, two engines being coupled on each shaft. There are in all sixteen cylinders, four being 37.4 in., four 49.2 in., four 78.4 in., and four 112.2 in. in diameter, with stroke of 70.9 in. Steam will be supplied at a pressure of 225 lbs. from twelve double and seven single-ended boilers, the total heating surface being 107,643 sq. ft. With the engines indicating 40,000 H. P. the vessel is expected to travel at 23½ to 24 knots. The Kaiser Wilhelm will leave Bremen on her maiden trip across the Atlantic on April 14.

"There would seem to be still reasonable room for doubt as to whether we are getting the most out of our screw propellers. It is a well-known recognized axiom that every type of ship requires its own particular type of propeller; whether it gets it or not is open to question. With her original propellers the Drake—one of the four mighty cruisers in whose construction one would have expected every improvement known to science to be embodied—made 23.5 knots, but when fitted with new propellers the speed was augmented to 24 knots with the same horse power. This is a striking result, and it will no doubt lead to more attention being paid to propellers than formerly.

PROGRESS OF WIRELESS TELEGRAPHY.

"Great progress has been made with wireless telegraphy during the past year. Only a short time ago telegrams were successfully transmitted from Cape Breton in Canada to Poldhu in Cornwall. The towers at the former station are 215 ft. high, these, of course, taking the place of the masts used in the earlier experiments. The Marconi company has now fitted up forty coast stations in Great Britain and Europe, sixty-six vessels of the British navy and twelve of the Italian navy. In the Congo Free State the Marconi apparatus is now working over 75 miles of a country in which it would be well nigh impossible to maintain wires or cables. With such a record there need be little wonder that considerable rivalry exists between the various inventors. There was a keen competition for the supply of instruments to the German navy, in which, we believe, the Marconi company took no part. The systems to be used on the German ships are Breun's, worked by Messrs. Siemens & Halske, and the Slaby-Arco, worked by the Allgemeine Elektricitata Gesellschaft. Castelli has brought out a new form of receiver in Italy which is stated to be an improvement upon the receiver with metallic filings.

THE USES OF LIQUID FUEL.

"Liquid fuel continues to make great progress in the merchant service, where the importance of large furnaces and combustion chambers is fully recognized. Indeed, as a well-known writer on the subject says, the indications seem to be that before long a coal-burning steamer will be a curiosity. At present some twenty-five regular Suez canal traders are using oil as fuel. In 1901, the latest figures available, 20,100 tons of liquid fuel, valued at £26,057, were landed into the Shell Trading & Transport Co.'s tanks at Suez. Of the deliveries from these tanks, 11,280 tons, all but 450 tons were placed on board steamers for bunker purposes. On a recent trip to the far east the German liner C. F. Laiesz, with a mean of 2,200 I. H. P., consumed 1.4 lbs. of oil per indicated horse power per hour against nearly 40 per cent greater consumption of coal on a corresponding trip. But in the case of vessels fitted with the Howden system of heated draft the consumption under both conditions is very much less. Using coal over an extended voyage, the consumption was a trifle under 1.5 lbs. per unit of per hour, while with oil fuel in the same boilers it was practically 1 lb., or to be exact 1.065 lbs. This result, however, has been almost equalled in the case of a ship fitted with the Orde-Armstrong apparatus, the oil consumption having worked out at 1.08 lbs. It would thus appear that, provided oil can be got as conveniently as coal at any point of the voyage and that the price does not exceed by more than 30 per cent the cost per ton of coal, economy must result from its use. Another advantage of oil fuel, which is often overlooked, is the great speed at which a ship can be bunkered with it. Speaking on this side of the question at the launch of the Silverlip in December last, Sir Andrew Noble said that a battleship which took twelve hours to coal in fair weather could be refueled with oil in three quarters of an hour in well nigh any weather.

THE ATLANTIC SHIPPING TRUST.

The builders and owners of British ships knew at the beginning of the year 1902 that the bad times were overdue. They awaited their coming with calm and anxiety, inseparable from impending adversity. Amid this calm came the announcement that an American syndicate had bought up several of the great Atlantic steamship lines. There was a panic in the press, in parliament, on the street. Foolish theories were propounded; the wildest rumors credited. British ship owners had been overreached; their patriotism was impugned; and a political motive was attributed to Mr. J. P. Morgan, who had negotiated the Atlantic shipping trust. A minority of the press argued that the Ismays, Mr. Pirrie and their British associates in the transaction were not going to sell their country and might be trusted to hold their own in the business of their lives; that the combination of shipping in the Atlantic trade, the 'community of interests' between American shippers and British ship owners, was a business matter to be conducted on business principles. This minority of journalists repudiated the theory that Mr. J. P. Morgan, Mr. Clement A. Griscom and their American colleagues would be parties to a grand scheme to compass the national humiliation of Britain.

"The provisional agreements were made public in February; the general agreements were published in full on May 9, 1902. The parties to these were Messrs. J. P. Morgan & Co., bankers of New York and London; Messrs. Harland & Wolff (in respect of ship building contracts); the White Star Line; the Dominion Line; the American and Red Star Lines; and the Atlantic Transport Line. The terms were: (*a*) That the merger company should have an authorized capital of £40,000,000, made up of a share capital of £24,465,000, one-half in 6 per cent cumulative divided preference stock and one-half in the ordinary stock of the International Mercantile Marine Co., and of £15,000,000 in 4½ per cent debentures. (*b*) The business properties and good will of the constituent companies were to be taken over as from Jan. 1, 1901, and the transactions and payments were to be concluded and made on or before Dec. 31, 1902. (*c*) Payment would be made to the companies entering the combine of a sum equal to ten times the net profits of such companies in the year 1900.

"These general terms were subject in detail and workings to conditions and collateral agreements. The merging operation is not accurately described as a sale by the British companies to the American syndicate. It was the consummation of a working agreement in perpetuity. That is the most accurate description of the operation. The payment to the White Star Line (and the example will suffice to explain the principle and general terms of all the necessary subsidiary agreements) was made (exclusive of new tonnage, as to 25 per cent in cash and the remainder of the purchase money in the preference and ordinary stock of the International company. The actual price paid to the White Star shareholders amounted to £10,699,436, the cash proportion at the time of payment being £3,147,236. The old share capital of the Oceanic (White Star) company was £700,000. This sum did not represent the earning power and true value of the shares, properties, connections, and good will. But perhaps that is all well covered by the original purchase money we have named, £10,699,436, the payment in cash of £3,147,236 and in preference and ordinary shares to the amount of £7,552,200.

"Under the agreements the British ships of the International company are to continue under the British flag, to be controlled by a British directorate and officered and manned according to the regulations of the board of trade. Moreover, the present and future British-built ships of the British companies in the combine will enjoy all the rights and privileges in respect of postal contracts and admiralty subsidies that are or shall be enjoyed by any other company—by the Cunard company, for example. The present arrangements existing between the White Star line and the British government are covered by a twenty-years' agreement, with a right of extension at the end of that period by a five-years' notice.

"The British tonnage of the International company's fleet—that is to say, the vessels of the White Star, the Leyland, the Dominion, the Atlantic Transport, and the American and Red Star lines—measures 508,607 tons. The entire fleet of the combine

consists of eighty-three vessels, measuring 688,973 gross tons. When we scan the earnings of other lines over a course of years, and contemplate the immense capital of this International company, it is difficult to see where a fair return upon the money is to be looked for. But already we read of agencies and offices being consolidated and economies effected. There is room for much of this, if the shareholders are to get, say 6 per cent on their holdings. The sheet anchor of faith in this regard is that cutting the rates is to be a thing of the past. The two transatlantic German lines are in the working agreement and there is no competing line in sight that would inaugurate a war of rates. This will give stability to trade, most acceptable to importers and exporters, while affecting substantial savings and making consequent profits for the fleets. Moreover, this great combination offers superior facilities to passengers, who may come by one ship and return by another, as convenience and business may make desirable. Goods may be shipped from the most advantageous ports. The central board is composed of men who can and who will influence freight for the ships of their own company, and so long as the rates are fair and not detrimental to the interests of producers and exporters no complaint will be heard. But the penalized will soon cry out should the rates rise at the expense of exporters. Mr. Griscom and his colleagues know these things, not to mention competition by strong men which unduly high freight rates would call forth from the British side of the Atlantic to compete for the carrying trade. The great fleet of the International company has been launched upon the ebb tide of trade; time must roll along before the flow comes again. But ability, economy, experience and influence may do much."

SUBSIDIES COMMITTEE REPORT.

Mayor Jones is no lover of subsidies and bounties, declaring that they violate the laws of trade and do not provide a solid business foundation and a wholesome atmosphere. It is the rule that the countries which pay the highest bounties have the poorest, least vigorous and progressive merchant navies. Concerning the British subsidies committee's report Mayor Jones says:

"There is much to be said for the protectionist in a new country, where land is for the taking, where the virgin soil is rich, and the legal rate of interest ranging between 7½ and 15 per cent. In these fertile lands the man who will sink for coal or drive for ore, or build furnaces, mills, factories and workshops, may be entitled to a guarantee of some return upon his money in the way of an import duty for a time upon the article he will produce. Daniel Webster thought so; John Stuart Mill concedes the principle. Senator Webster did not foresee the difficulties of weaning the infant coal industry. But the British protectionist cannot justify his votes for an export duty on coal or an import duty on corn by the idea of free land, virgin soil, a bountiful harvest following a small expenditure of labor and money, or a higher legal rate of interest secured by farm mortgages than any manufacturing industry might be expected to yield. He stands alone upon the earth, defying the doctors, the facts of history, the experience of his own country—a phenomenon of economic perversity. His congenial deformity bids defiance to the ripest and most skilful surgeons of yesterday and today. The question of subsidizing British ships has been advocated by interesting persons and protectionists for a long time. An inquiry into the question was deemed desirable, and on the motion of Mr. Evelyn Cecil, a committee was appointed in May, 1901, 'to inquire into the system of subsidies to steamship companies under foreign governments and the effect thereby produced on British trade.' The committee made its report on Dec. 3, 1902. With the evidence it is a veritable and valuable library of facts and opinions bearing upon shipping subsidies in various countries. The committee was of opinion: (1) That British ship owners are able to hold their own under fair conditions; (2) that skill and industry, and not subsidies, constitute the major factors in the development of trade and shipping under foreign flags; (3) that no subsidy should be granted without control by the government over the maximum rates of freight; (4) that open competition with government aid, and without the interference suggested in paragraph three, is best; (5) that a general system of subsidies is costly and inexpedient; (6) that East Africa is an exception to the rule, justifying favorable consideration of a subsidy to a line of steamers to that part of the world; (7) that subsidies should be controlled by a permanent committee, that adequate speed should be a condition of subsidies, that no sale of subsidized ships should take place without the consent of the government, that a majority of the directors of subsidies companies should be British, and that captains and officers and a proportion of the crews of subsidized ships should also be British; (8) that the light dues should be abolished, board of trade regulations applied to foreign vessels precisely as they are applied to British vessels, and that something should be done to induce foreign countries to abolish coasting trade restrictions."

Directors of the Cleveland & Buffalo Transit Co. met this week and elected the following officers: President, M. A. Bradley; vice-president, George W. Gardner; treasurer, R. C. Moodey; secretary and general manager, T. F. Newman. Should the weather be favorable the company's season will begin April 1.

The Detroit & Cleveland Navigation Co. announces that navigation will open between Cleveland and Detroit on March 18. The steamer City of Detroit will leave for Cleveland on that date. The Cleveland & Toledo Line will open about April 1, and the Cleveland & Buffalo Line about April 15.

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French Navy	276,460 H. P.
English Royal Navy	849,300 "
Russian Imperial Navy	193,900 "
Japanese Imperial Navy	122,700 "
Austrian Imperial Navy	32,900 "
Italian Royal Navy	13,500 "
Chilian Navy	26,500 "
Argentine Navy	13,000 "
The "Messageries Maritimes" Company	87,600 "
Chemins de fer de l'Ouest: (The French Western Railway Co.) Steamships plying between Dieppe and Newhaven	18,500 "
Total Horse Power of Boilers in Use	1,634,360

WORKS: Ateliers et Chantiers de l'Ermitage, at Saint-Denis (Seine), France.

TELEGRAPHIC ADDRESS: Belleville, Saint-Denis-Sur-Seine.

EARLY DEVELOPMENT OF MINES IN MINNESOTA.

Duluth, Minn., March 11.—Henry P. Wieland of Fisher Minn., in speaking of the early development of iron mining in Minnesota, said to a representative of the Marine Review:

"In the summer of 1866 the Wieland families were living at the then thriving community of Beaver Bay, on the north shore of Lake Superior and about 50 miles northeast from the "fond du lac." There was no Duluth in those days and Superior was a mere settlement of Indians and a few whites. The Wielands were engaged in fishing, lumbering, farming and trading for furs. At that time an excitement arose over the discovery of gold in northern Minnesota, near Vermillion lake, then the center of a large Chippewa population. Several expeditions went from the head of the lake to Vermillion, and one, under the guidance of Christian Wieland, now deceased, started from Beaver Bay. The promoter of that expedition was Dr. Eames, then, or about that time, state geologist. He went along, and others accompanying him and C. Wieland, were my father, Henry Wieland, his brother, Albert Wieland, and some others whom I do not now recall, together with some Indians.

"About that same time, or a little after, another party started out from Superior under the guidance of Thos. Clark, with whom was Robt. McLean of old Superior, long a well-known figure thereabouts. When the Eames-Wieland party got to the Mesabi heights C. Wieland found indications of iron ore. He informed the state geologist in camp that night that he thought there were good indications of iron in that locality, to which Eames responded: 'We are not after iron, we are after gold.'

"So the party continued on in search of gold and finally reached Lake Vermillion. They went via Beaver Bay river over the main divide to the series of lakes at the head of Stoney river, and thence to White Iron lake and on across the country to Vermillion. It was a frightful trip, and is very different in the telling now from what it seemed when C. Wieland told it years after. At their destination also Mr. Wieland reported indications of iron. This was about a year later than the same discovery by the late Geo. R. Stuntz of Duluth, as given in a recent sketch of his life."

"I believe," continued Mr. Wieland, "that the Mesabi Iron Co. was the first iron company organized in this state. This company was started in 1882, though its projectors, the Wielands, Ramsey, Spalding and others, surveyed the lands it now holds in the early 70's. The company is still living and has recently given an option on its holdings, some 8,000 acres, for the sum of $30,000."

A curious fact in this connection is that while this was the original company and located lands that seemed excellent, no merchantable ore has ever been found thereon, most of the deposits seeming to be a magnetitic schist, much of them, perhaps, under a gabbro intrusion from the south. Some years ago the Mesabi Iron Co. sold its pine land holdings for $30,000. Last year the same pine was sold for $300,000, and this winter it has again been sold, this time to the Oliver Iron Mining Co., to be used as mine timber for the sum of $500,000. Had the Mesabi Iron Co. held its pine that alone would have been a fortune at this time. There are not wanting indications to show that the present option on its lands is more for what timber may remain unsold than for what iron there may be in the inclosing rocks.

NEW COIL AND PIPE BOILERS

The supervising inspectors of steam vessels at their annual meeting in Washington a few weeks ago, approved coil and pipe boilers presented by the following named persons and firms, when such boilers are constructed in all their parts of wrought iron, steel, or cast steel, in the manner as provided in the general rules of the board: C. W. Krotz, New Orleans; Philip J. Miller, Annapolis, Md.; S. T. Powers, New Orleans, porcupine boiler; Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, Morris Heights, N. Y., types "D improved" and "E improved;" Emil Santsche, Eureka, Cal., porcupine boiler; T. B. Perkins, Grand Rapids, Mich., improved porcupine; "Salamandrine" boiler, manufactured by the Salamandrine Boiler Co., Newark, N. J., presented by H. L. Ricks, Eureka, Cal.; Taunton Automobile Co., Taunton, Mass., porcupine boiler; Tabrett & Lewin, San Francisco, and Egbert P. Watson, Elizabeth, N. J., porcupine boiler.

The board also approved the Tippett spring safety valve, presented by Norman L. Hayden, Columbus, and the Adams spring safety valve, made by Thomas Adams & Co., Manchester, England, and presented by Luther D. Lovekin, Camden, N. J.

The oil barge Shenango for the J. M. Guffey Petroleum Co. is to be launched from the yard of the Bath Iron Works on March 18.

AROUND THE GREAT LAKES.

In the matter of the libel and petition of the Gilchrist Transportation Co., for limitation of liability the United States district court at Cleveland has extended the time within which petitioners shall take depositions to April 10, 1903. The case of John D. Gilchrist et al versus the Steamer Lackawanna, has been discontinued by stipulation and costs paid by libellant.

It will interest a great many to know that Capt. John Sinclair, who was taken from his post at the St. Clair channel lights two months ago in a serious condition, has sufficiently recovered to be restored to duty. He is seventy-two years old and has been associated with the great lakes industry for the past fifty-two years. He is a brother of Cyrus H. Sinclair, the manager of the Great Lakes Towing Co.

Capt. A. B. Chambers of Cleveland has been appointed assistant marine superintendent of the Pittsburg Steamship Co., vice Capt. B. B. Inman, deceased. He will have his headquarters at Sault Ste. Marie. Mr. Roy Williams of Cleveland, who has for some time past had charge in the office of the Steel Corporation with certain work relating to the movement of iron ore, will be connected with the vessel department.

Names have been selected for quite a number of the steamers which are building at the lake yards. The steamer building at the Cleveland yard of the American Ship Building Co. for G. A. Tomlinson of Duluth is to be named Saxona. The two steamers building at Bay City for Mr. Tomlinson will be christened Sinaloa and Sonoma. The Prindeville steamer, building by the Columbian Iron Works, St. Clair, Mich., and which is to be launched next week, is to be named Winnebago. The steamer building at this yard for the George Hall Coal Co. will be named John C. Howard. The two steamers building for the Provident Steamship Co. will be named D. K. Clemson and D. G. Kerr.

Funeral services for the late Capt. W. W. Brown of Cleveland were held at his late residence, Kenilworth road, Euclid Heights, on Monday afternoon, conducted by Rev. A. J. Alexander of Beckwith Memorial church, of which Mr. Brown was a member. The active pall bearers were Messrs. H. S. Wilkinson, H. H. Ward, George Warden, George Rudd, Charles L. Mosher, Frank S. Masten, M. A. Bradley and E. P. Lenihan. The honorary pall bearers were Messrs. Harvey D. Goulder, F. D. Herriman, Jacob Seibig, W. S. Carr, George P. McKay, J. B. Cowle, H. A. Hawgood, Carl Russell and E. G. Macomber of Cleveland, and L. C. Smith, H. W. Smith and William Nottingham, of Syracuse, N. Y. The remains were placed in a vault at Lake View cemetery.

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VICE-PRESIDENT OF NATIONAL TUBE CO.

The Iron Trade Review pays a deserved tribute to Mr. Edward Worcester, of the National Tube Co., which we are pleased to reprint. The Iron Trade Review says:

"At the annual meeting of the National Tube Co. to be held this month Edward Worcester will be elected first vice-president to succeed W. H. Latshaw, whose resignation was handed in and accepted recently. Mr. Latshaw resigned all active connection with the pipe and tube trade in order that he might give his extensive private interests more attention. Mr. Worcester in addition to discharging the duties of vice-president will continue at the head of the sales department, a position which he has filled with great success since the organization of the National Tube Co. For the past thirty years Mr. Worcester has been connected with the pipe and tube business of this country and his extensive knowledge of the industry has earned for him his present merited advancement. In 1873 he was connected with the Chapman Valve Mfg. Co. of Boston, and in 1875 he entered the service of the Redfield, Bowen & Walworth Co. of Chicago, agents of the National Tube Works Co. In 1877 he became connected with the Walworth Mfg. Co. of Boston, and five years later entered the employ of the Crane Co. of Chicago, being elected secretary of that concern in 1884. In 1888 he was appointed local sales manager in charge of the St. Louis office of the National Tube Works Co., and in 1897 he was advanced to the position of assistant sales manager of this concern. When the National Tube Co. was formed he was made general sales agent.

NEW YORK HARBOR NOTES.

The Marine Construction & Dry Dock Co., Mariner Harbor, Staten Island, New York, is building a twin-screw launch for Mr. George W. C. Drexel of Philadelphia from designs by Gardner & Cox of No. 1 Broadway, New York. The vessel is to be 65 ft. over all with 10 ft. 6 in. beam, and will have a plumb bow and torpedo boat stern, with a yacht overhang. Her motive power will consist of two 20-H. P. standard gasolene engines, which are calculated to make her a speedy craft, and as in all gasolene motor boats built by this company special precautions will be taken in the installation of gasolene tank, thus eliminating all danger from leakage and accumulation of oil between bulkheads. The cabin will be provided with large, drop windows. The pilot house will have hinged, transom seats. Aft of the pilot house will be the observation saloon, which will have transoms on the starboard side and cloak closet to port. The dining room will be furnished with sliding transom berths on each side, also buffets, bookcases and drop leaf dining table, with well-ventilated, zinc-lined lockers underneath. Aft of the dining room, to port, will be the lavatory, which will be fitted with the latest improved furnishings, while to starboard will be the galley. The cockpit is to be self bailing and will also be fitted with transom seats, which will be used as berths, while over the cockpit ridgepole an awning will be fitted. The joiner work will be of natural color butternut.

The M. T. Davidson Pump Co., Brooklyn, N. Y., has been awarded the contract for building the pumps for the new battleship Connecticut. Its bid was $38,880. The contract for condensers was awarded to the Wheeler Condenser & Engineering Co., of New York.

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SHIP BUILDING DURING FEBRUARY.

The bureau of navigation reports that fifty-five vessels of 23,906 gross tons were built in the United States and officially numbered during February, as follows:

DISTRICTS.	WOOD.				STEEL.		TOTAL.	
	SAIL.		STEAM.		STEAM.			
	No.	Gross.	No.	Gross.	No.	Gross	No.	Gross.
Atlantic and gulf	17	1,329	12	1,109	4	5,088	33	7,526
Porto Rico	2	17	....	....	....	....	2	17
Pacific	1	845	6	574	3	8,935	10	10,354
Hawaii	....	....	....	....	....	....	....	....
Great lakes	....	....	....	....	1	4,655	1	4,655
Western rivers	....	....	8	1,266	1	88	9	1,354
Total	20	2,191	26	2,949	9	18,766	55	23,906

Of these the Arizonian for the American-Hawaiian Steamship Co., the Monroe for the Old Dominion Steamship Co., and one launched at Lorain for H. A. Hawgood of Cleveland were the largest.

STAGE OF WATER ON THE LAKES.

The gage records of the United States Lake Survey show the following mean stages of water above mean sea level, for February, 1903:

	Stages during February. Feet.	Higher than during same month last year. Feet.	Lower than during same month last year. Feet.	Higher than during February, 1895. Feet	Lower than during February, 1895. Feet.
Lake Superior	601.63	0.03	.....	0.01	0.09
Lake Michigan	579.42	0.23	....	.....	.....
Lake Huron,	579.26	.....	0.05	0.70	0 14
*Lake Erie	571.79	0.07	.....	.....	.....

*Reported by Cleveland office.

Present fall, Lake Huron to Lake Erie, 1.10 ft. less than year ago.

Capt. Mulford Thomas Hunter died at Detroit last week. He was over eighty years old. He was born at Boston Springs, N. Y., and had been associated with the lake trade since his early manhood. He began his lake experience on Lake Ontario. He was one of the builders and owners of the old side-wheeler Jay Cooke and for several years was on the Keweenaw, another well-known passenger steamer. The latter part of his life he spent in retirement.

The second mortgage bonds of the United States Steel Corporation to be issued in exchange for stock, and also to secure $50,000,000 in cash, have declined steadily since they were offered on the curb. Authorities differ as to their value, some holding that a 5 per cent second mortgage industrial bond is not worth more than 85 for long purchase.

The British warship Mars has lowered the coaling record by taking on board 1,570 tons of coal at an average rate of slightly over 241 tons per hour. This feat, which constitutes a world's record, was accomplished at Portsmouth.

A four-masted wooden schooner, to be built by E. & I. K. Stetson, Brewer, Me., will be named Horace A. Stone.

At a Sunday school.—"You see it took Noah a hundred years to build the ark. Does any boy wish to ask anything about that?"

Small boy.—"Yes, please, miss. Was there a strike on?"

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TRADE NOTES.

A large band re-sawing machine for the Rilatt & Barrett Dry Dock Co. of Camden, N. J., is being made by the Atlantic Works Incorporated of Philadelphia. The machine is being especially constructed for ship yard work.

The Cleveland Hardware Co. is installing a complete electrical equipment for the operation of its plant, and has recently purchased from the Westinghouse Electric & Mfg. Co. one 75-kilowatt and one 100-kilowatt, two-phase alternators, together with exciters, switchboard, ten 20-H. P. motors and two 10-H. P. motors. The plant is already in operation and is doing very satisfactory work. Geo. S. Rider & Co. are the engineers.

Mr. Charles S. Powell, who has been associated with the Westinghouse electric interests since 1893, and who, for the past six years, has been manager of the Cleveland office of the Westinghouse Electric & Mfg. Co., has changed the scene of his activities from the United States to Europe. He has been appointed assistant manager of the British Westinghouse Electric & Mfg. Co., Ltd., and has already entered upon the duties of his new position. Mr. Powell, who was one of the most popular men in the electrical business in the United States, is bound to be equally well liked in Great Britain. His headquarters are in the Westinghouse building, Norfolk street, Strand, London, W. C.

As usual a very heavy trade both foreign and domestic in air compressors and pneumatic tools is reported from the headquarters of the Chicago Pneumatic Tool Co. in Chicago. Business of this company on the Pacific coast has increased to such a degree that they have appointed on the coast a general western sales agent in the person of Mr. Henry Engels who is known to the pneumatic tool trade. Mr. Engles will have headquarters with Eccles & Smith, 91 Fremont street, San Francisco, who will continue as representative of the company with Mr. Engels. Among concerns purchasing pneumatic tools from the Chicago company recently are the following: Boston & Montana Consolidated Copper & Silver Ming. Co., Black Eagle, Mont.; Sharon Steel Hoop Co., Sharon, Pa.; American Beet Sugar Co., Oxnard, Cal.; Buscher & Gast, Chicago; Crerar, Adams & Co., Chicago; F. W. Horne, Yokohama, Japan; Tacoma Smelting Co., Tacoma, Wash.; Alfred H. Post & Co., New York; Southern Pacific Co., Bakersfield, Cal.; Rand Drill Co., New York; Colorado Fuel & Iron Co., Minnequa, Colo.; Seaboard Air Line, Portsmouth, Va.; Rhode Island Granite Co., Westerly, R. I.

Hitherto there was one place in the world where a man could escape the newspapers and the cares of the day. That place was mid-ocean. Now, however, even that is gone. The ocean newspaper has made its appearance, the Cunard Line establishing one on the steamship Etruria and supplying it with news, via wireless telegraph. The Cunard company was the first to recognize the importance of the Marconi system to the mercantile marine and it follows naturally that the company should be the first to establish a newspaper on board ship. It is an interesting speculation as to whether a ship's crew in the future is to include an editorial staff and printing plant and whether it will issue a succession of screeching extras every few minutes during the day. At any rate the ocean newspaper will give the passengers something new to gossip about.

Homeseekers' excursions by way of the Nickel Plate road. Ask nearest agent about them or address E. A. Akers, C. P. & T. A., Cleveland, Ohio. 23, Apr. 13

John D. Gilchrist, Pres. John Marvon, Sec'y.
John Flajole, Gen'l Mgr.

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Steamer for Sale.

For Sale.—Steamer City of Grand Rapids. In good condition and will sell at a bargain. For particulars address Barry Trans. Co., Chicago, Ill. Apr. 2.

Towing Outfit for Sale.

For Sale—Complete towing outfit, including tug, scow, sand pump, etc. All in good order; reasonable price Address Butler Bros., St Paul Minn. Apr. 2.

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140 CONGRESS ST. BOSTON.

U. S. Engineer Office, Grand Rapids, Mich., March 2, 1903. Sealed proposals for repair of south pier at Portage Lake, Mich., and extension and repair of piers at Frankfort, Mich., will be received here until 3 p. m., April 1, 1903, and then publicly opened. Information furnished on application. CHARLES KELLER, Capt., Engrs. Mar. 26.

U. S. Engineer Office, Galveston, Tex., Feb. 23, 1903. Sealed bids, in triplicate, for improving Aransas Pass, Tex., by removing part of old jetty, will be received until 2 p. m., March 25, 1903, and then publicly opened. For information apply to C. S. RICHE, Capt., Engrs. Mar. 19.

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DATA BOOK—Naval architects and engineers' data book. By T. H. Watson. A reliable and simple means of recording valuable data, etc., of vessels and engines. Size of book, 8¾ in. by 5 in., cloth, $2.

ELEMENTARY STEAMSHIP—by Barker. New and enlarged edition. $2.50.

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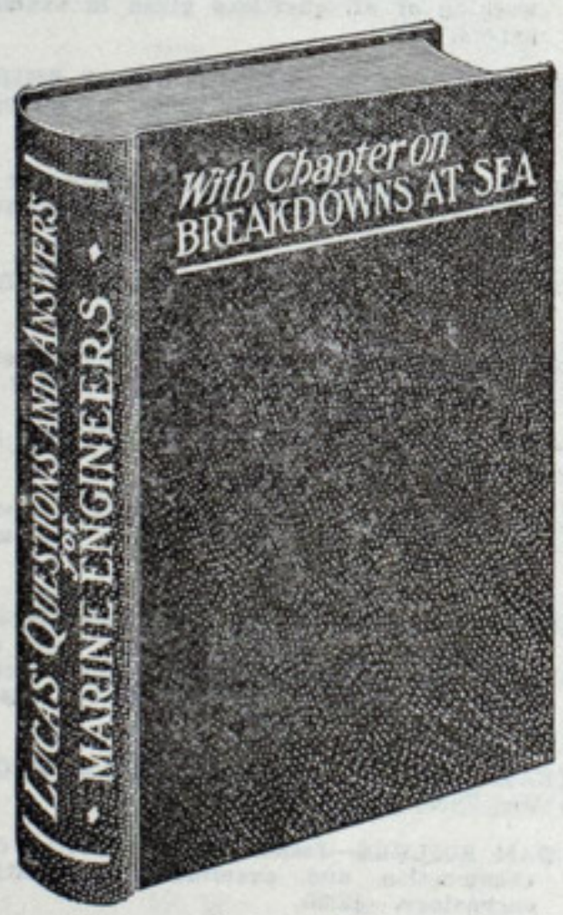

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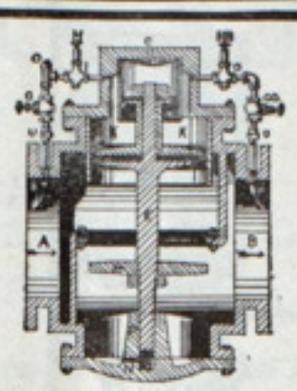

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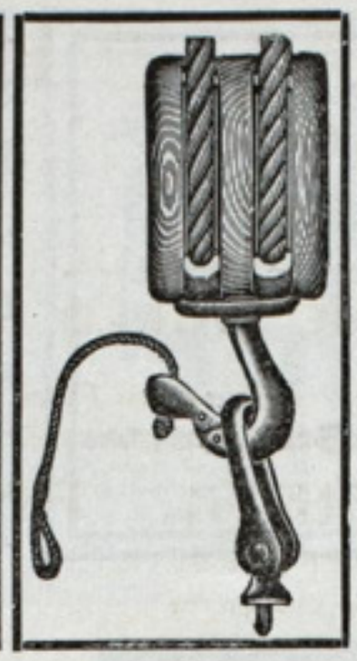

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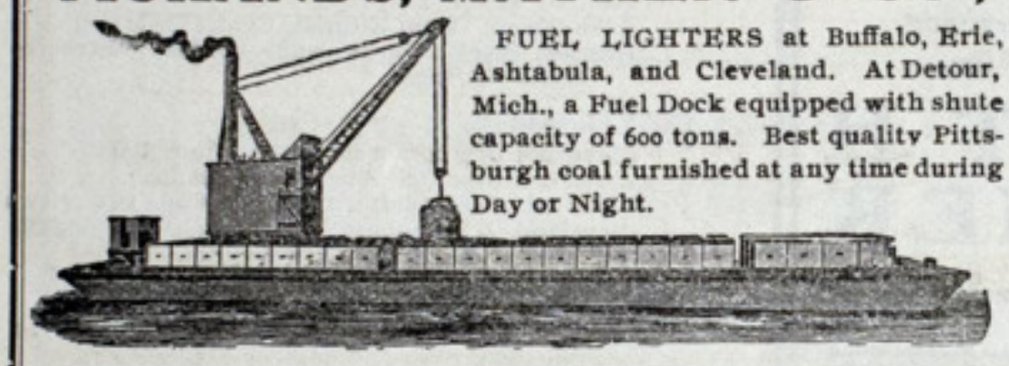

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Sturtevant, B. F. Co. .....Boston.
United Marine Mfg. & Supply Co.....New York.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

ELECTRIC STEERING GEAR, SPEED AND RUDDER INDICATORS, ETC.

Electro-Dynamic Co. .....Philadelphia.

ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bath Iron Works, Ltd. .....Bath, Me.
Buffalo Forge Co. .....Buffalo.
Chicago Ship Building Co.....Chicago.
Chase Machine Co. .....Cleveland.
Craig Ship Building Co. .....Toledo, O.
Cramp, Wm. & Sons .....Philadelphia.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co. .....Detroit
Fletcher, W. & A. Co. .....Hoboken, N. J.
Fore River Ship & Engine Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit, Mich.
Hall Bros. .....Philadelphia.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co. .....East Boston, Mass.
MacKinnon Mfg. Co. .....Bay City, Mich.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Mosher, Chas. D. .....New York.
Neafie & Levy Ship & Engine Bldg. Co. Philadelphia.
Newport News Ship Building Co. Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Thropp, J. E. & Sons Co. .....Trenton, N. J.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Trigg, Wm. R. Co.....Richmond, Va.
Trout, H. G. .....Buffalo.
Warrington Iron Works .....Chicago.
Willard, Chas. P. & Co. .....Chicago.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.
Cory, Chas. & Son .....New York.
Electro-Dynamic Co. .....Philadelphia.
MacLean Hydraulic Signal Co.....Chicago.
Seidler-Miner Electric Co. .....Detroit.

ENGINEERING BOOKS.
Audel & Co., Theo.....New York.
Marine Review Pub. Co.....Cleveland.

ENGINEERING SPECIALTIES AND SUPPLIES.
Crane Co. .....Chicago.
Farnan Brass Works .....Cleveland.
Kieley & Mueller .....New York.
McCutcheon, C. H. .....Buffalo.
New York Belting & Packing Co.....New York.
Reilly Repair & Supply Co., James.....New York.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.
Electro-Dynamic Co. .....Philadelphia.
Garrett-Cromwell Engineering Co.....Cleveland.
Gaskin, Edward .....Buffalo.
Hunt, Robt. W. & Co. .....Chicago.
Kidd, Joseph .....Duluth, Minn.
Logan, Robert .....Cleveland.
Mosher, Chas D. .....New York.
Newman, R. L.....New York.
Pittsburg Testing Laboratory, Ltd.....Pittsburg.
Powell, Ambrose V. .....Chicago.
Roelker, H. B. .....New York.
Sadler, Perkins & Field.....New York.
See, Horace .....New York.
Wood, W. J. .....Chicago.

EVAPORATING AND DISTILLING APPARATUS.
Reilly Repair & Supply Co., James....New York.

FANS FOR VENTILATION, EXHAUST, ETC.
Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

FEED WATER PURIFIERS AND HEATERS.
Learmonth, Robert .....Buffalo.
Reilly Repair & Supply Co., James.....New York.
Ross Valve Co. .....Troy, N. Y.

FIXTURES FOR LAMPS, OIL AND ELECTRIC.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

FORGES.
Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.
Cleveland City Forge & Iron Co. .....Cleveland.
Fore River Ship & Engine Co. .....Quincy, Mass.
Macbeth Iron Co.....Cleveland.

FLUE WELDING.
Fix's, S. Sons .....Cleveland.

FURNACES FOR BOILERS.
Continental Iron Works.....New York.

FUELING COMPANIES AND COAL DEALERS.
Castner, Curran & Bullitt (Pocahontas) ....Phila.
Graham Coal & Coke co., Ldt.....Detroit.
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.
Pittsburg Coal Co. .....Cleveland.
Rochester & Pittsburg Coal & Iron Co. ....Buffalo.
Smith, Stanley B. & Co. .....Detroit.
Youghiogheny & Lehigh Valley Coal Co...Chicago.

GASKETS, RUBBER.
New York Belting & Packing Co.....New York.

GAS BUOYS.
Safety Car Heating & Lighting Co. ..New York.

GAS AND GASOLINE ENGINES.
Chase Machine Co. .....Cleveland.

GAGES, STEAM AND VACUUM.
American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.

GRAPHITE.
Dixon Crucible Co., Joseph .....Jersey City, N. J.

HAMMERS, STEAM.
Chase Machine Co. .....Cleveland.
Railway Appliances Co .....Chicago.

HARDWARE, SHIP.
Topky Brothers .....Ashtabula, O.

HATCH GEARS.
"Long-Arm" System Co. .....Cleveland.

HEATING APPARATUS.
Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co. .....Boston.

HOISTS FOR CARGO, ETC.
American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co., Inc. ....Cleveland.
Chase Machine Co. .....Cleveland.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....New York.
Hyde Windlass Co. .....Bath, Me.
Lidgerwood Mfg. Co.....New York.
Marine Iron Co. .....Bay City.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

HOLLOW STAYBOLT IRON.
Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HOSE FITTINGS.
Farnan Brass Works. .....Cleveland.

HOSE, RUBBER.
New York Belting & Packing Co.....New York.

HYDRAULIC MACHINERY.
Watson-Stillman Co., The.....New York.
Wood & Co., R. D. .....Philadelphia.

ICE MACHINERY.
American Linde Refrigerating Co. .....New York.
Roelker, H. B. .....New York.

INDICATORS FOR STEAM ENGINES.
American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.

INJECTORS.
American Injector Co.....Detroit.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Lunkenheimer Co. .....Cincinnati.
Penberthy Injector Co. .....Detroit, Mich.

INSURANCE, MARINE.
Brown & Co. .....Buffalo.
Brown, W. W. .....Cleveland.
Dunham, R. J. .....Chicago.
Elphicke, C. W. & Co. .....Chicago.
Hawgood & Co., W. A. .....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co. .....Cleveland.
Insurance Co. of North America....Philadelphia
McCarthy, T. R. .....Montreal.
McCurdy, Geo. L. .....Chicago.
Mitchell & Co. .....Cleveland.
Peck, Chas. E. & W. F. ...New York and Chicago.
Richardson, W. C. .....Cleveland.
Sullivan, D. & Co. .....Chicago.
Weeks, F. H. .....New York.

IRON ORE AND PIG IRON.
Bourne-Fuller Co. .....Cleveland.
Hanna, M. A. & Co. .....Cleveland.
Pickands, Mather & Co. .....Cleveland.

LATHE, FOR CUTTING PIPE THREADS.
Kent Machine Works .....Brooklyn, N. Y.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.
Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Warrington Iron Works .....Chicago.
Willard, Chas. P. .....Chicago.

LIFE PRESERVERS, LIFE BOATS, BUOYS.
Armstrong Cork Co. .....Pittsburg.
Drein, Thos. & Son .....Wilmington, Del.
Kahnweiler's Sons, D. .....New York.
Lane & DeGroot .....Long Island City, N. Y.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.

LIGHTS, SIDE AND SIGNAL.
Helvig, H. A. J.....New York.
Russell & Watson .....Buffalo.

LOGS.
Walker & Sons, Thomas .....Birmingham, Eng.
Nicholson Ship Log Co. .....Cleveland.
Also Ship Chandlers.

MACHINISTS.
Chase Machine Co.....Cleveland.
Macbeth Iron Co. .....Cleveland.
Union Machine & Boiler Co.....Cleveland.
Ward Machine Co.....Cleveland.

MACHINE TOOLS (WOOD WORKING).
Atlantic Works, Inc. .....Philadelphia.

MACHINERY, NEW AND SECOND HAND.
Bowler & Co. Geo. H. .....Cleveland.
Clyde Machine Works.....Chicago.

MAN-HOLES, SWING DOORS, ETC.
"Long-Arm" System Co. .....Cleveland.

MARINE RAILWAYS, BUILDERS OF
Crandall & Son, H. I. .....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.
Fogg, M. W.....New York.

MECHANICAL DRAFT FOR BOILERS.
American Ship Building Co. .....Cleveland
Bloomsburg & Co., H. .....Baltimore, Md.
Buffalo Forge Co. .....Buffalo.
Detroit Ship Building Co. .....Detroit
Sturtevant, B. F. Co. .....Boston.

METALLIC PACKING.
Allen, Joseph .....Collingswood, N. J.
American Metallic Packing Co.....Cleveland.
Hayden Mfg. Co., N. L.....Columbus, O.
Katzenstein, L. & Co. .....New York.
U. S. Metallic Packing Co. .....Philadelphia.

METAL POLISH.
Bertram's Oil Polish Co. .....Boston.

MOTORS, GENERATORS—ELECTRIC.
Buffalo Forge Co. .....Buffalo.
Electro-Dynamic Co. .....Philadelphia.
Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
"Long-Arm" System Co. .....Cleveland.
Seidler-Miner Electric Co. .....Detroit.
Sturtevant, B. F. Co. .....Boston.
United Marine Mfg. & Supply Co.....New York.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

NAUTICAL INSTRUMENTS.
Bliss, John & Co. .....New York.
Ritchie, E. S. & Sons .....Brookline, Mass.

NAVAL ARCHITECTS.
Gaskin, Edward .....Buffalo.
Kidd, Joseph .....Duluth, Minn.
Logan, Robert .....Cleveland.
Mosher, Chas. D. .....New York.
Newman, R. L. .....New York.
Sadler, Perkins & Field.....New York
See, Horace.....New York.
Wood, W. J. .....Chicago.

OAKUM.
DeGrauw, Aymar & Co. .....New York.
Stratford Oakum Co.,.....Jersey City, N. J.

OILS AND LUBRICANTS.
Dixon Crucible Co., Joseph .....Jersey City, N. J.
Standard Oil Co. .....Cleveland.

PACKING.
Allen, Joseph .....Collingswood, N. J.
American Metallic Packing Co. .....Cleveland.
American Steam Packing Co. .....Boston.
Crane Co. .....Chicago.
Hayden Mfg. Co., N. L.....Columbus, O.
Jenkins Bros. .....New York.
Katzenstein, L. & Co. .....New York.
New York Belting & Packing Co.....New York.
United States Metallic Packing Co. ....Philadelphia.

PAINTS.
Baker, Howard H. & Co. .....Buffalo.
Berry Bros., Ltd. .....Detroit.
Day's Varnish & Dryer Co. .....Cleveland.
Mohawk Paint & Chemical Co.....New York.
New Jersey Zinc Co. .....New York.
Topky Brothers .....Ashtabula, O.
Upson-Walton Co. .....Cleveland.

PATENT ATTORNEYS.
Thurston & Bates .....Cleveland.

PATTERN SHOP MACHINERY.
Atlantic Works, Inc. .....Philadelphia.

PIPE—BRASS AND COPPER, IRON PIPE SIZE.
Waterbury Brass Co.....New York.

PIPE, WROUGHT IRON.
Bourne-Fuller Co .....Cleveland.
Crane Co .....Chicago.
Macbeth Iron Co.....Cleveland.

PLANING MILL MACHINERY.
Atlantic Works, Inc. .....Philadelphia.

PLATE BENDING AND PLANING MACHINES.
Wood & Co., R. D. .....Philadelphia.

PLUMBING, MARINE.
Mott, J. L., Iron Works .....New York.
Reilly Repair & Supply Co., James....New York.
Sands, Alfred B. & Son .....New York.

PNEUMATIC TOOLS.
Allen, John F., ... New York.
Chicago Pneumatic Tool Co. .....Chicago.
Railway Appliances Co .....Chicago.

POLISH FOR METALS.
Bertram's Oil Polish Co.....Boston.

POWER DOORS AND HATCHES.
"Long-Arm" System Co. .....Cleveland.

PRESSURE REGULATORS.
Kieley & Mueller .....New York
Ross Valve Co. .....Troy, N. Y.

BUYERS' DIRECTORY OF THE MARINE TRADE.—Continued.

PROPELLER WHEELS.

American Ship Building Co. .....Cleveland
Atlantic Works .....East Boston, Mass.
Baltimore Ship Building & Dry Dock Co. Baltimore.
Bath Iron Works, Ltd. .....Bath, Me.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co. .....Bath, Me.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co. .....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
MacKinnon Mfg. Co. .....Bay City, Mich.
Maryland Steel Co. .....Sparrow's Point, Md.
Milwaukee Dry Dock Co. .....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Phila.
Newport News Ship Bldg. Co...Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Phosphor Bronze Smelting Co., Ltd...Philadelphia.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roelker, H. B. .....New York.
Sheriffs Mfg. Co. .....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Thropp & Sons Co., J. E. .....Trenton, N. J.
Trigg, Wm. R. Co. .....Richmond, Va.
Trout, H. G. .....Buffalo.

PROJECTORS, ELECTRIC.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F. Mfg. Co. .....New York.
Clyde Machine Works .....Chicago.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Wks. Oswego, N. Y.
Long Arm System Co. .....Cleveland.

PUNCHES, RIVETERS, SHEARS.

Chicago Pneumatic Tool Co. .....Chicago.

REFRIGERATING APPARATUS.

Roelker, H. B. .....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register .....Cleveland.
Record of American & Foreign Shipping.New York.

RELEASING HOOKS FOR DETACHING BOATS.

Standard Automatic Releasing Hook Co. New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co. .....Cleveland.

RANGES.

Russell & Watson .....Buffalo.

RIVETS—BRASS AND COPPER.

Waterbury Brass Co.....New York.

RUBBER INSULATED WIRES.

Roebling's Sons, Jno. A...New York and Cleveland.

SAFETY VALVES.

American Steam Gauge Co. .....Boston.
Ashton Valve Co.....Boston.
Hayden Mfg. Co., N. L.....Columbus, O.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co. .....Buffalo.
Upson-Walton Co. .....Cleveland.
Wilson & Silsby .....Boston.

SALVAGE COMPANIES.

See Wrecking Companies.

SCHOOLS—NAUTICAL, ENGINEERING.

Chicago Nautical School .....Chicago.

SEARCH LIGHTS.

Elwell-Parker Electric Co. .....Cleveland.
General Electric Co. .....Schenectady, N. Y.
Seidler-Miner Electric Co. .....Detroit.
Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co. .....Cleveland.

SHIP BUILDERS.

American Ship Building Co. .....Cleveland.
Atlantic Works .....East Boston, Mass.
Baltimore Ship Building & Dry Dock Co..Baltimore.
Bath Iron Works, Ltd.....Bath, Me.
Buffalo Dry Dock Co. .....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co. .....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co. .....Detroit.
Fore River Ship & Engine Co. .....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Jenks Ship Building Co. .....Port Huron, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Marine Construction & Dry Dock Co.....
.....Mariner's Harbor, S. I., N. Y.
Maryland Steel Co .....Sparrow's Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Moran Bros. Co. .....Seattle, Wash.
Neafie & Levy Ship & Engine Bldg. Co.....Phila.
Newport News Ship Bldg. Co....Newport News, Va.
Nixon, Lewis .....Elizabeth, N. J.
Pusey & Jones Co. .....Wilmington, Del.
Risdon Iron Works .....San Francisco.
Roach's Ship Yard .....Chester, Pa.
Smith & Son, Abram .....Algonac, Mich.
Trigg, Wm. R. Co. .....Richmond, Va.
Warrington Iron Works .....Chicago.
Willard, Chas. P. & Co. .....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co. .....Buffalo.
Moran Bros. Co. .....Seattle, Wash.
Reilly Repair & Supply Co., James....New York.
Upson-Walton Co. .....Cleveland.

SHIP LANTERNS AND LAMPS.

Helvig, H. A. J.....New York.
Page Bros. & Co.....New York.
Russell & Watson.....Buffalo.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co. .....Jersey City, N. J.

SPARS—LARGE SIZES.

Moran Bros. Co.....Seattle, Wash.

STAYBOLTS, IRON OR STEEL, HOLLOW, OR SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co.....New York.
Holmes, Samuel.....New York.
King, Rufus S.....New York.
McCarthy, T. R.....Montreal, Can.
Newman, R. L.....New York.
Weeks, F. H.....New York.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
Erie & Western Trans. Co. .....Buffalo.
International Nav. Co.....Philadelphia.
Pere Marquette R. R. & S. S. Line.....Milwaukee.
Red Star Line.....New York.

STEEL CASTINGS.

Seaboard Steel Casting Co.....Chester, Pa.
Macbeth Iron Co.....Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co. .....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
Detroit Shipbuilding Co.....Detroit.
Electro-Dynamic Co.....Philadelphia.
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Queen City Engineering Co.....Buffalo.
Sheriff Mnfg. Co.....Milwaukee.

STOCKS, BONDS, SECURITIES.

Brown, W. W.....Cleveland.
Fahey & Co.....Cleveland.

SUBMARINE DIVING APPARATUS

Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Gaskin, Edward.....Buffalo.
Newman, R. L.....New York.
See, Horace.....New York.
Wood, W. J.....Chicago.

TESTS OF MATERIAL.

Hunt, Robert W. & Co.....Chicago.
Pittsburg Testing Laboratory, Ltd.....Pittsburg.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co.....New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F.....New York.
Chicago Pneumatic Tool Co.....Chicago.
Railway Appliances Co .....Chicago.
Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

TRAPS, STEAM.

Kieley & Mueller.....New York.

TRUCKS.

Boston & Lockport Block Co..... .....Boston.

TUBING, SEAMLESS.

Benedict & Burnham Mnfg. Co....Waterbury, Conn.
National Tube Co.....Pittsburg.
Waterbury Brass Co.....New York.

VALVES, STEAM SPECIALTIES, ETC.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Crane Co. .....Chicago.
Farnan Brass Works .....Cleveland.
Hayden Mfg. Co., N. L.....Columbus, O.
Jenkins Bros.....New York.
Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.
Ross Valve Co. .....Troy, N. Y.

VALVES FOR WATER AND GAS.

Wood & Co., R. D.....Philadelphia.
Ross Valve Co. .....Troy, N. Y.

VARNISHES.

Berry Brothers, Ltd.....Detroit.
New Jersey Zinc Co.....New York.
Also Ship Chandlers.

VESSEL CASTINGS.

American Ship Building Co.....Cleveland.
Macbeth Iron Co.....Cleveland.

VESSEL AND FREIGHT AGENTS.

Boland, John J.....Buffalo.
Brown & Co.....Buffalo.
Brown, W. W.....Cleveland.
Dunham, R J. .....Chicago.
Elwell, Jas. W. & Co.....New York.
Elphicke, C. W & Co.....Chicago.
Hall & Root.....Buffalo.
Helm & Co., D. T. .....Duluth.
Hawgood & Co., W. A.....Cleveland.
Holmes, Samuel.....New York.
Hutchinson & Co.....Cleveland.
King, Rufus S.....New York.
McCarthy, T. R.....Montreal.
Newman, R. L.....New York.
Mitchell & Co.....Cleveland.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Weeks, F. H.....New York.

VENTILATING APPARATUS FOR SHIPS.

Buffalo Forge Co. .....Buffalo.
Sturtevant, B. F. Co.....Boston.

WIRE—BRASS AND COPPER.

Waterbury Brass Co.....New York.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co.....Buffalo.
DeGrauw, Aymar & Co. .....New York
Upson-Walton Co.....Cleveland.

WHISTLES, STEAM.

American Steam Gauge Co. .....Boston.
Ashton Valve Co. .....Boston.
Farnan Brass Works .....Cleveland.
Lunkenheimer Co.....Cincinnati.

WHITE METAL—SHEETS, RODS AND WIRE.

Waterbury Brass Co.....New York.

WINDLASSES.

American Ship Windlass Co.....Providence, R. I.
American Ship Building Co. .....Cleveland
Hyde Windlass Co.....Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.

WINCHES.

American Ship Windlass Co.....Providence, R. I.
Hyde Windlass Co.....Bath, Me.

WOOD WORKING MACHINERY.

Atlantic Works, Inc.....Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
Midland Towing & Wrecking Co., Ltd.Midland, Ont.

YACHT AND BOAT BUILDERS.

Drein, Thos. & Son.....Wilmington, Del.
Lane & DeGroot.....Long Island City, N. Y.
Marine Construction & Dry Dock Co. ...New York.
Truscott Boat Mfg. Co. .....St. Joseph, Mich.
Warrington Iron Works.....Chicago.
Willard, Chas. P. & Co.....Chicago.

YAWLS.

Drein, Thos. & Son.....Wilmington, Del.
Lane & DeGroot.....Long Island City, N. Y.

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No. 28, N Y & Bost Ex ...	*7:40am	*8:00am
No. 40, Toledo & Buff Ac.	†10:00am	†10:40am
No. 32, Fast Mail	*11:25am	*11:30am
No. 44, Ac via Sandusky..	†1:40pm	.....
No. 46, Southwestern Ex.	.....	*3:00pm
No. 106, Conneaut Accom	.....	†4:30pm
No. 6, Lim Fast Mail....	*5:40pm	*5:45pm
No. 26, 20th Cent Lim....	*7:40pm	*7:43pm
No. 10, C., N Y & B Sp....	*7:30pm	*7:50pm
No. 16, New Eng Ex.....	*10:30pm	*10:35pm
No. 2, Day Express.	†9:10pm	†9 25pm
No. 126, Norwalk Accom.	†7:50am	.....

Westward.	Arrive from East.	Depart West.
No. 11, Southwestern Lim	*3:25am	.....
No. 7, Day Express.	.....	†6:10am
No. 15, Bost & Chi Sp.....	*3:10am	*3:15am
No. 19, Lake Shore Lim..	*7:15am	*7:20am
No. 23, Western Express.	*10:30am	*10:35am
No. 33, Southern Express	*12:25pm	....
No. 133, Cleve & Det Ex..	.....	*12:45pm
No. 47, Accomodation.....	†11.20am	†3:00pm
No. 141, Sandusky Accom.	.....	†3:10pm
No. 43, Fast Mail	*4:35pm	*4:40pm
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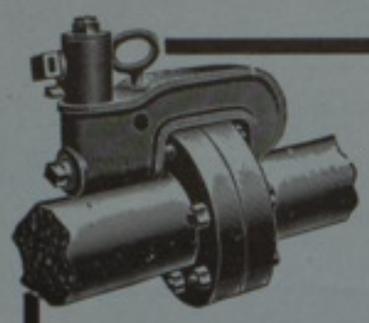

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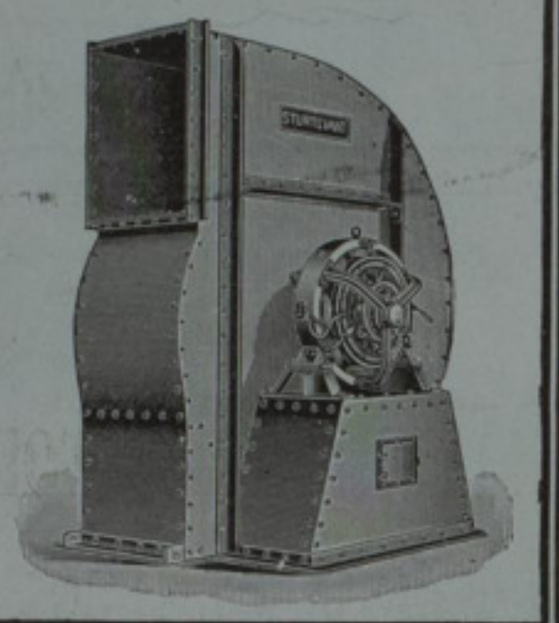

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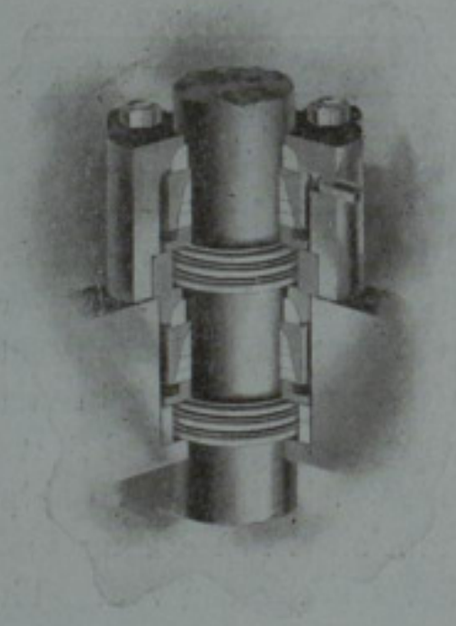

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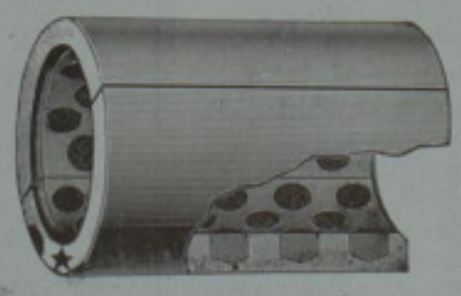

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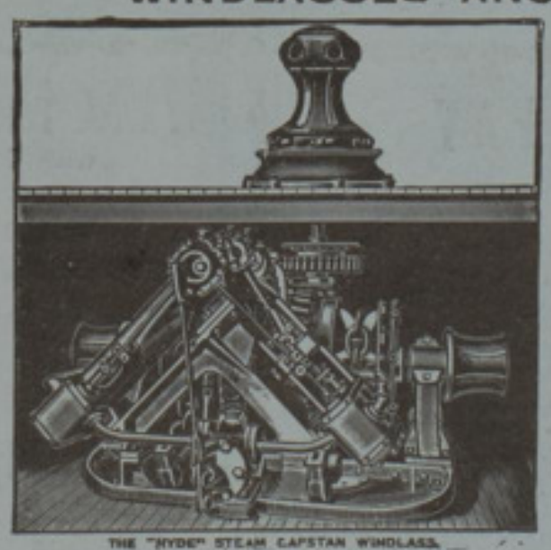

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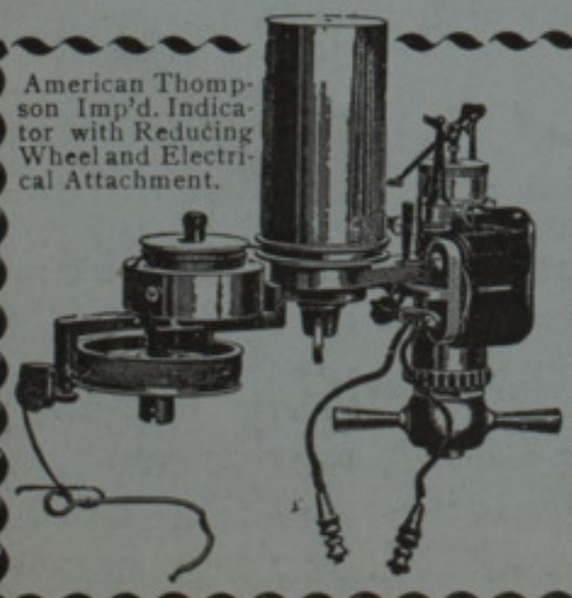

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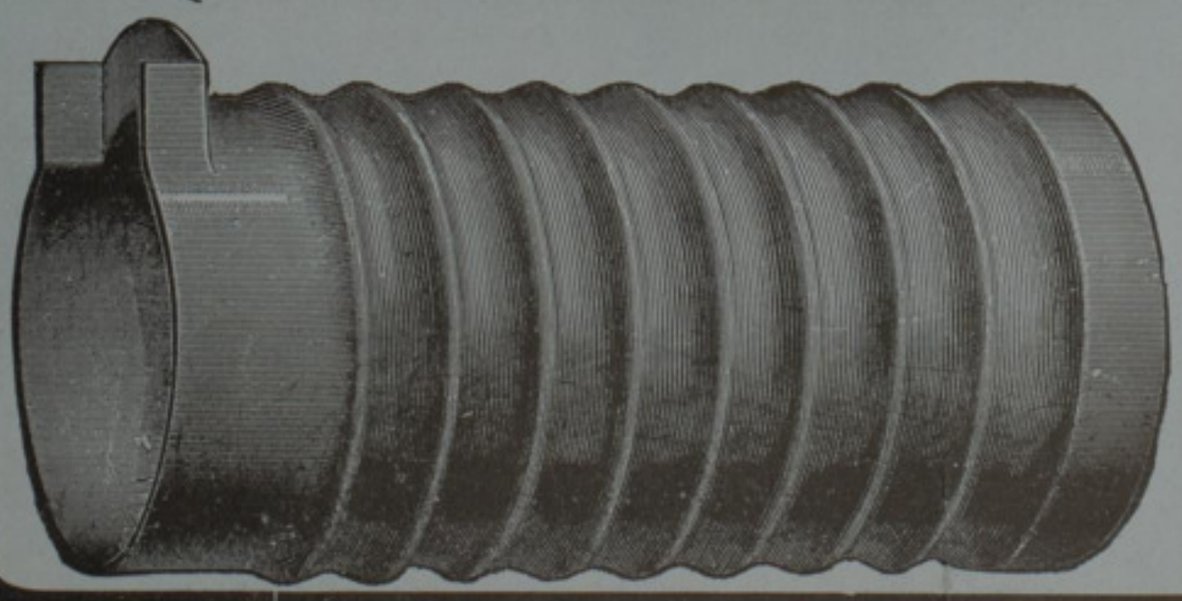

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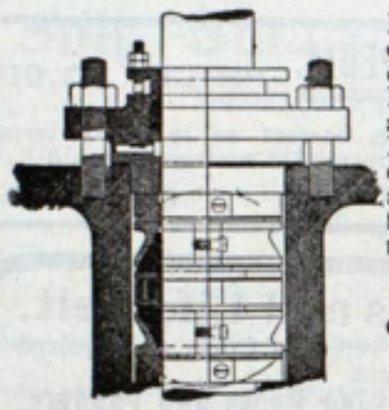

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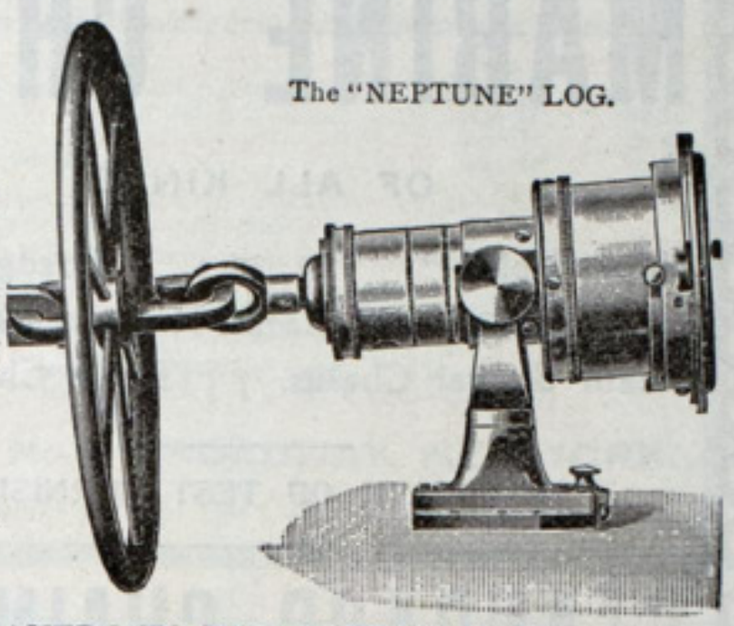

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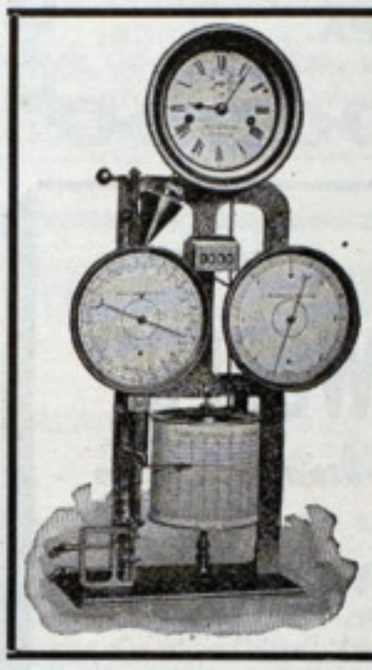

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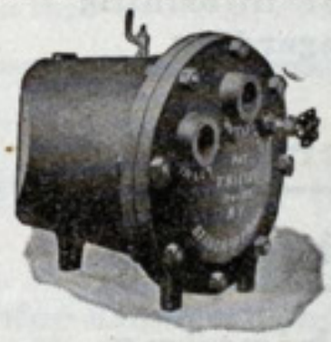

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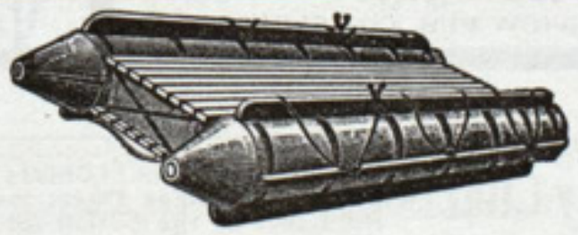

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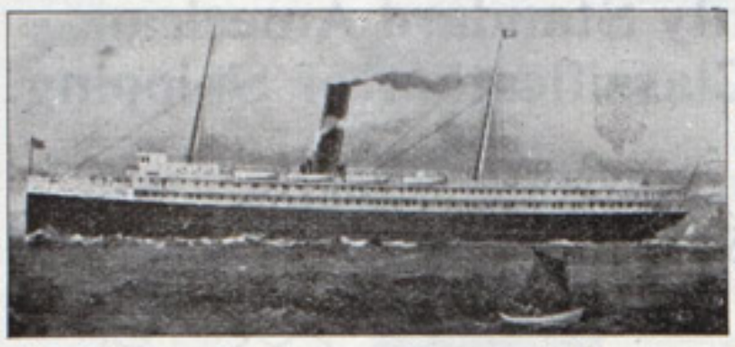

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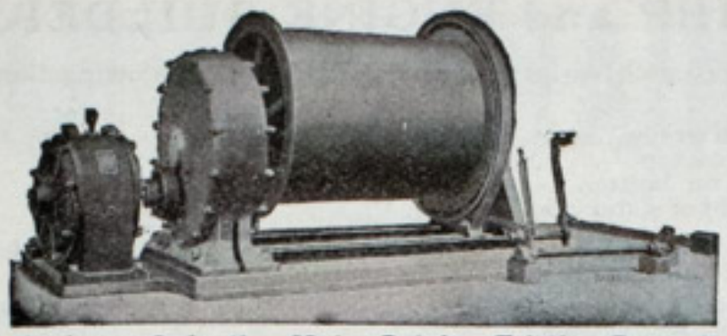

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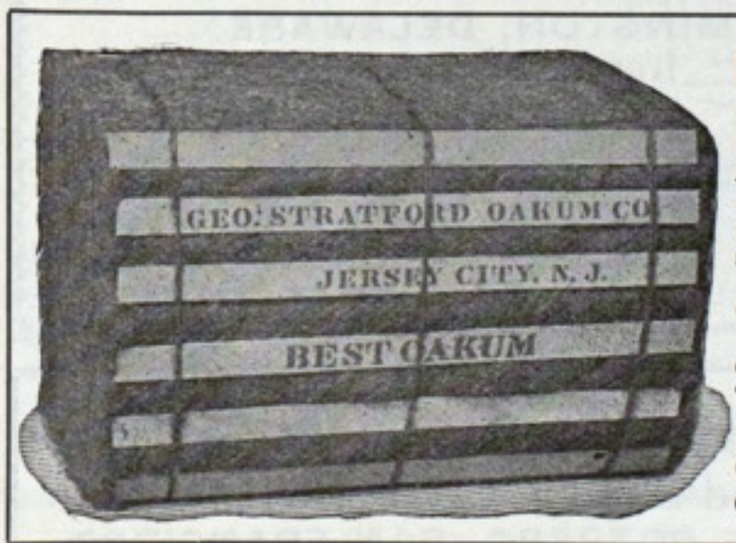

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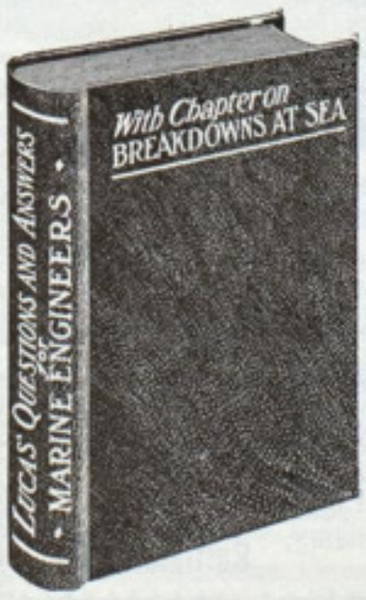

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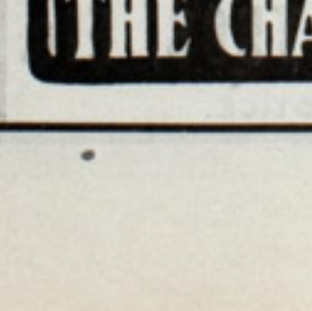

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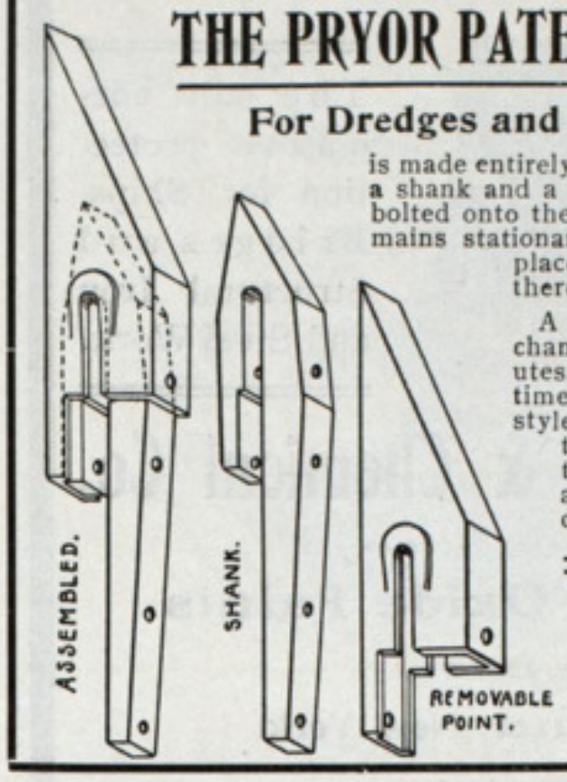

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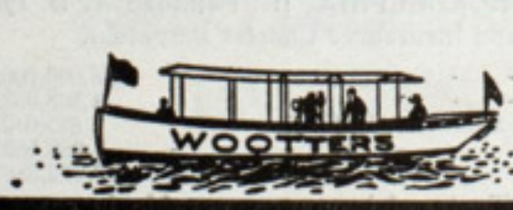

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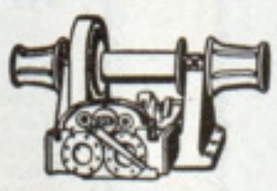

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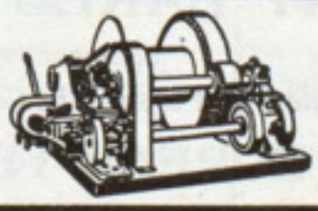

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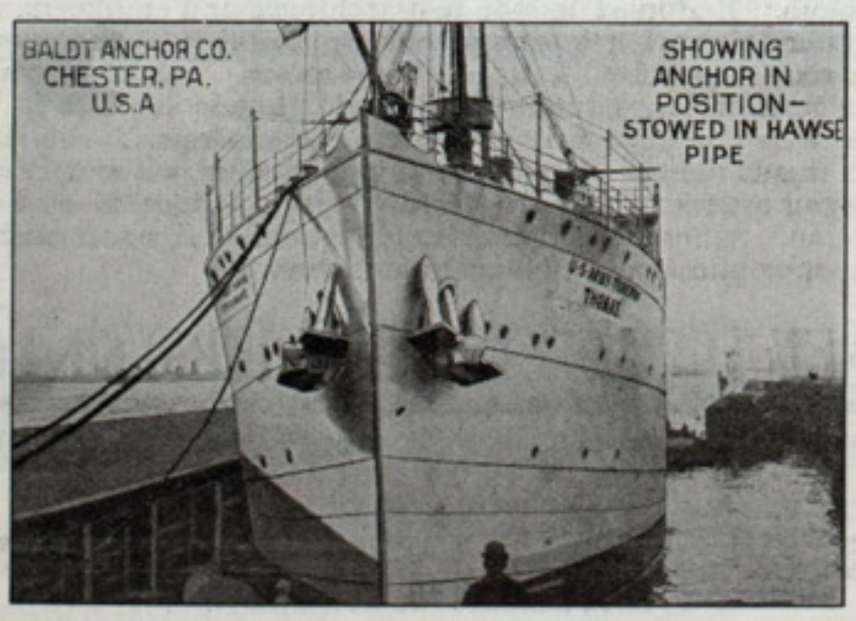

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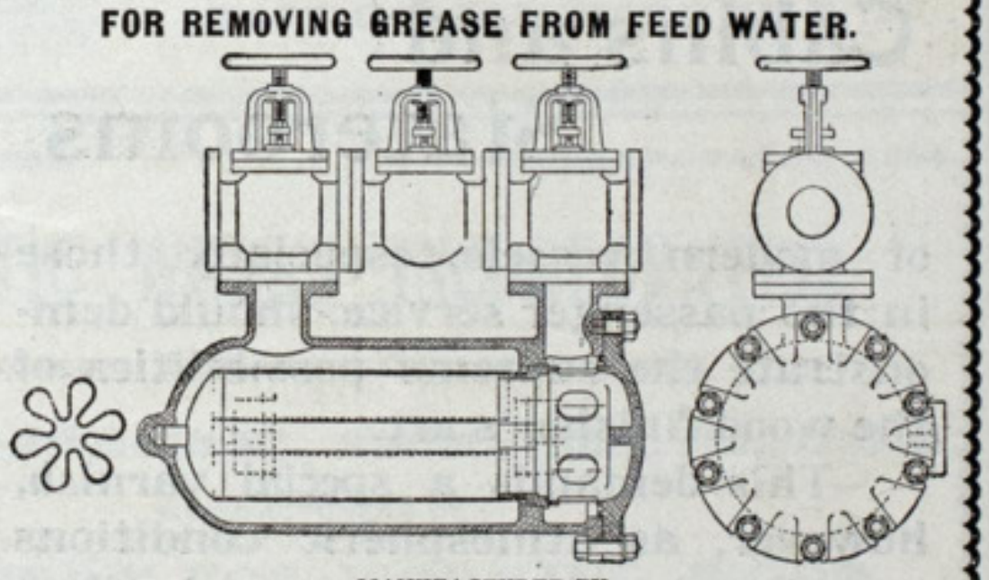

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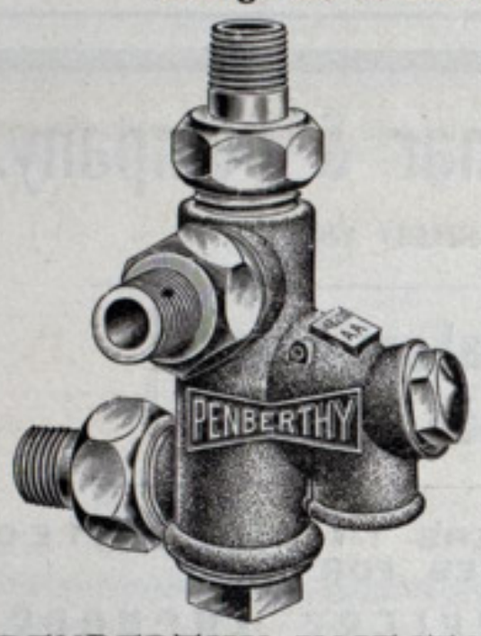

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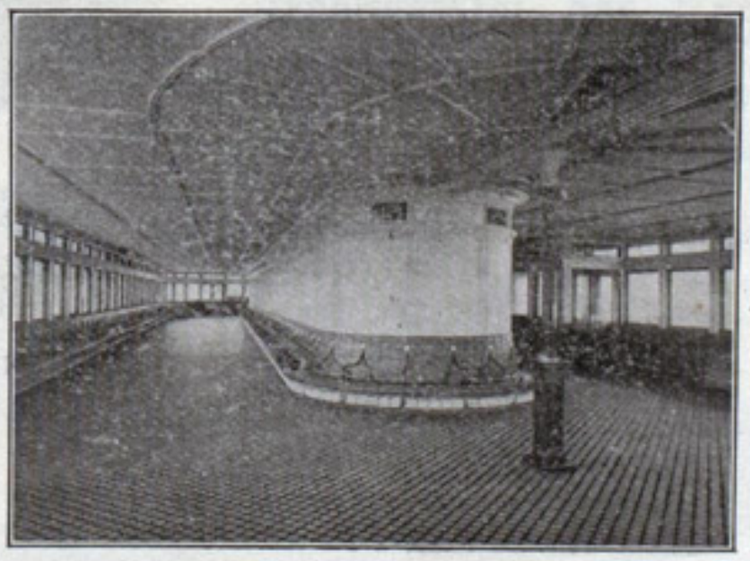

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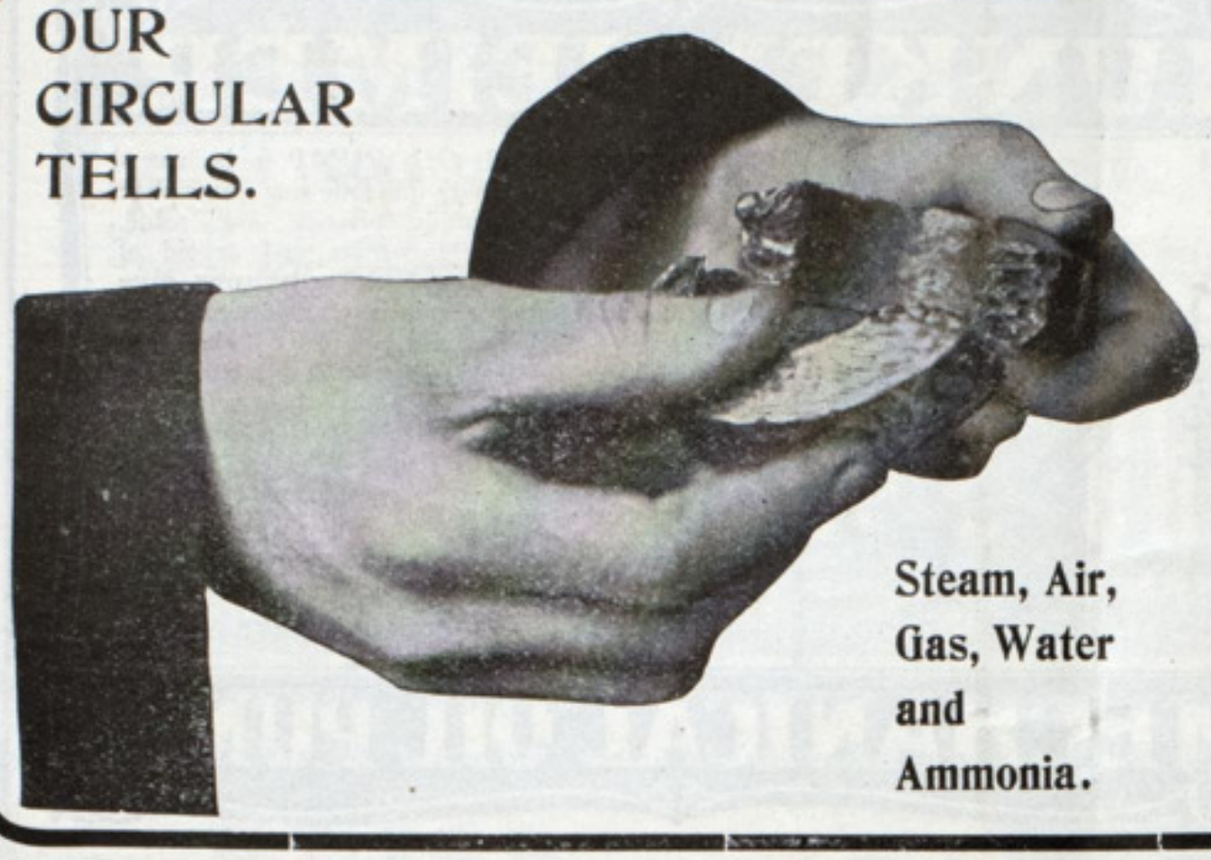

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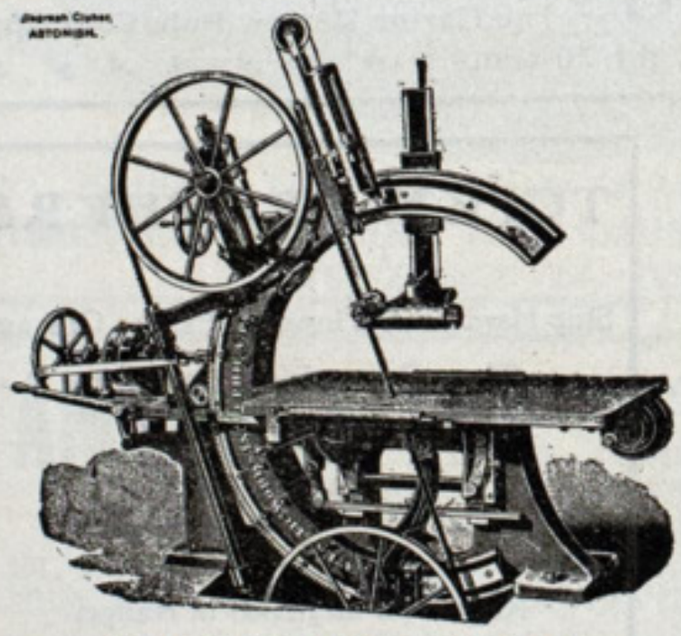

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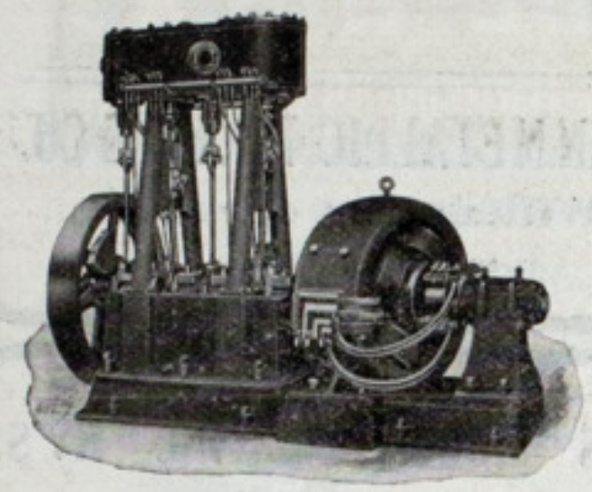

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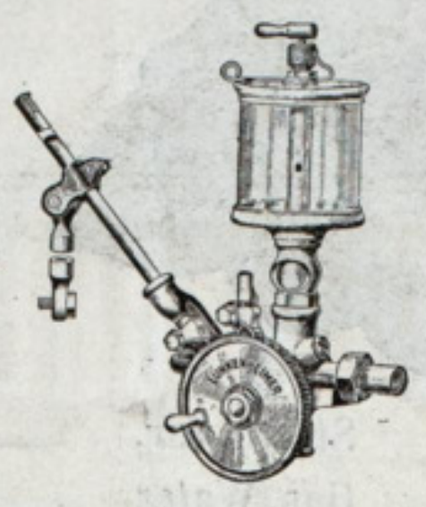

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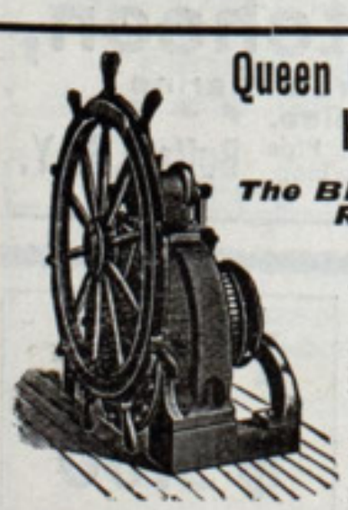

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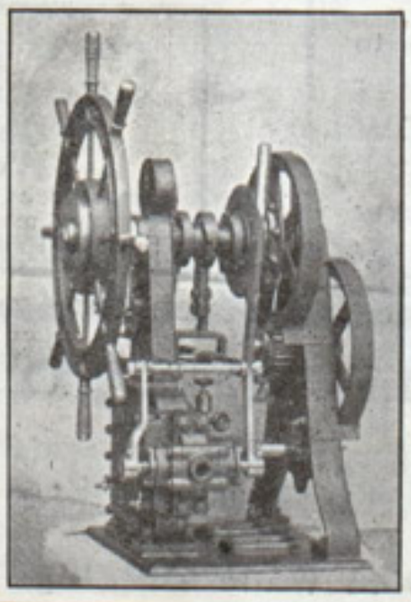

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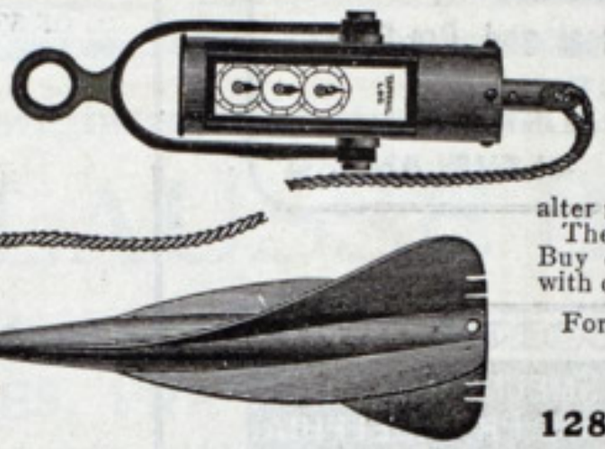

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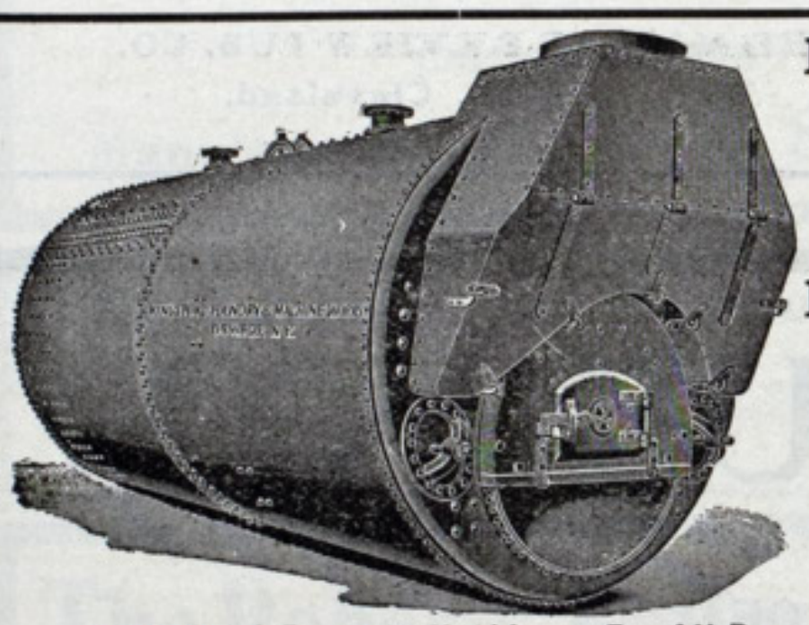

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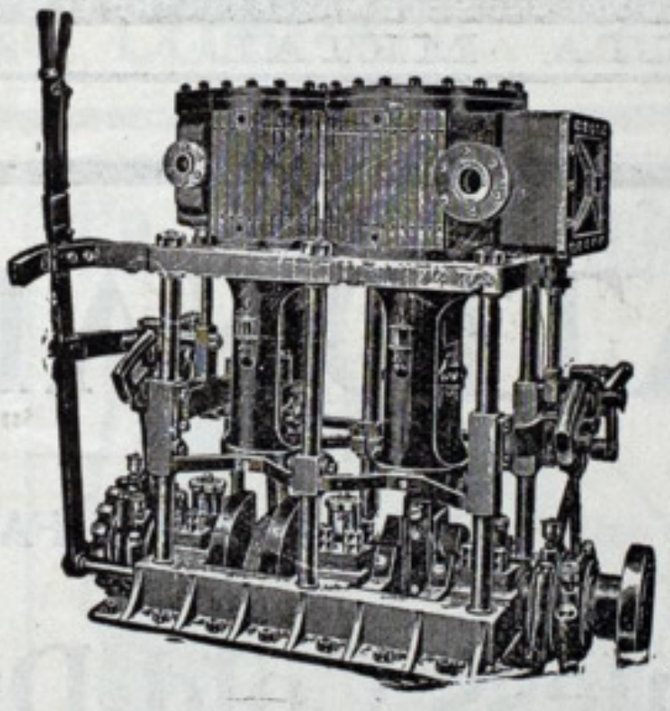

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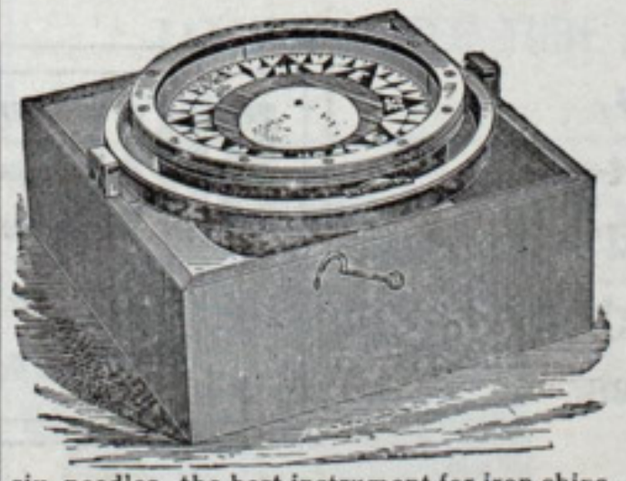

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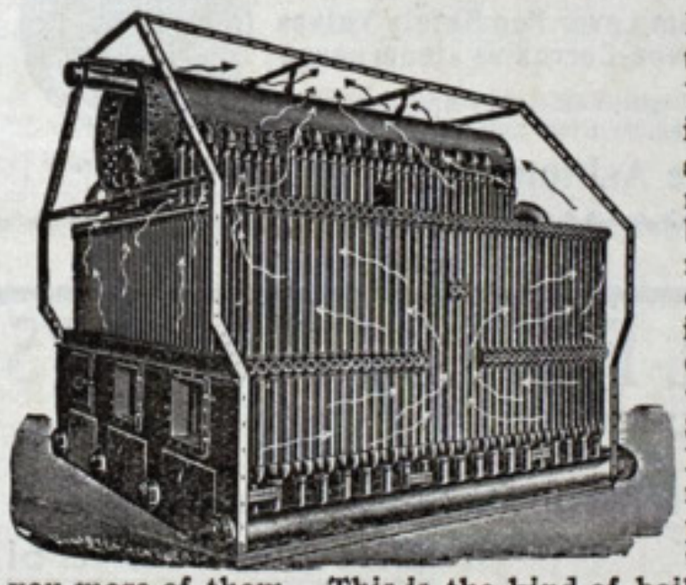

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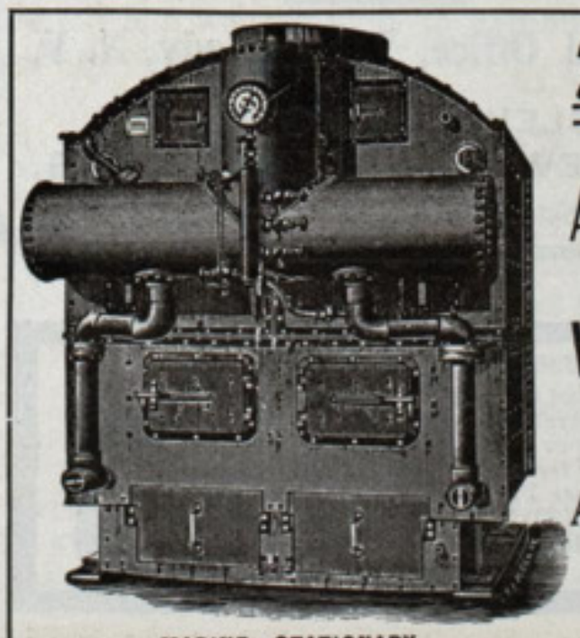

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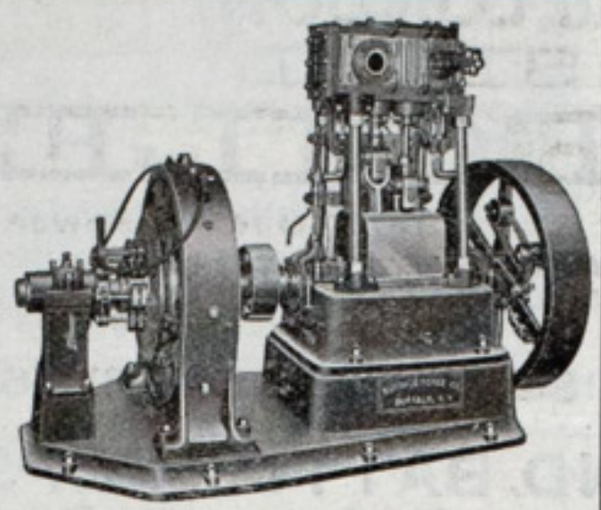

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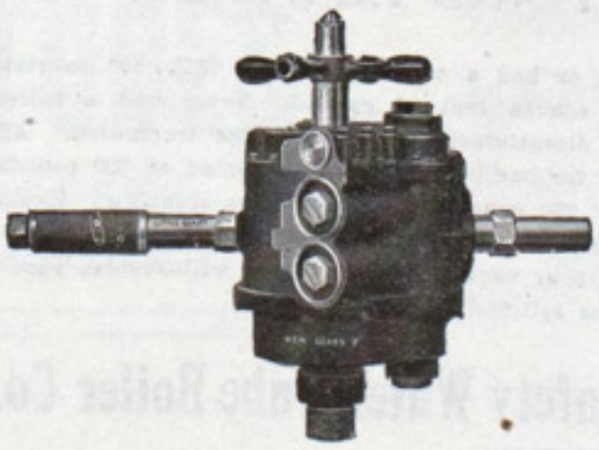

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